PAMPHLET COLL.— BOARD OF AGRIC

Miscellaneous Publications, No. 3.
(Revised Edition, 1927)

BOARD OF AGRICULTURE FOR SCOTLAND

The Maintenance of Pure and Vigorous Stocks of Varieties of the Potato

ADVISORY

EDINBURGH:
PRINTED UNDER THE AUTHORITY OF HIS MAJESTY'S
STATIONERY OFFICE.
1927

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THE MAINTENANCE OF PURE AND VIGOROUS STOCKS OF VARIETIES OF THE POTATO.

I.—NOTES ON BOTANICAL FEATURES OF VARIETIES AND ON ROGUING.

The advantage and necessity of distributing seed stocks of varieties of the potato true to name, free from admixture and in vigorous condition are obvious and recognised by the farming community. It is unnecessary to enlarge on them further than by stating the statutory obligations which are laid on those who market potatoes for planting, viz. :—

1. The Seeds Act and Seeds Regulations demand a statement by the seller to the buyer of conformity to name, *i.e.* purity, country of origin, size and dressing.
2. The Wart Disease Orders issued under the Destructive Insects and Pests Acts regulate the distribution of varieties not immune from Wart Disease, and enforce conformity to name and a high standard of purity for seed stocks of immune varieties.

The chief object of this publication is to place before the grower in convenient form such information and advice as are likely to be of service to him in the handling and roguing of commercial varieties of the potato.

Health.—The grower should endeavour to obtain healthy stocks (see " Degeneration Diseases," p. 95).

Purity.—In order to raise a pure stock of a variety, the grower should plant only seed from inspected stocks which have been certified true to type and at least 99·5 per cent. pure. Nevertheless, although the seed may be from crops which have been inspected, the grower should not take it for granted that his crop will not require roguing. Mixing through careless handling occasionally takes place after the crop has been inspected, while rogues may accidentally get into a crop from outside sources. Again, certain rogues—those that produce large crops of small tubers—tend to increase in proportion from year to year, *e.g.* Early Market. In varieties which produce relatively few tubers of seed size, *e.g.* Great Scot and Majestic, any rogues occurring will tend to

increase. These facts frequently account for stocks being above the standard in one year and below it the next. In view of the insidious rapidity of the increase of rogues, growers should take particular care to purify their crops. Plants which have assumed the "wilding"* condition also tend to multiply and should be removed. The differential effects of Blight may result in an increase of the percentage of rogues which are less susceptible than the variety in which they occur.

Precautionary Measures to avoid Mixing of Stocks.—The mixing of stocks of a particular variety with other varieties is nearly always due to want of necessary precaution at some point in the handling of the crop or the management of the rotation.

Close cropping is frequently responsible for spoiling a good stock. Instances have been reported where a stock has been rendered impure to the extent of 20 per cent. by the presence of groundkeepers from previous crops. Where the rotation is short, and where the farming practice allows, the potatoes should be alternated in successive rotations with the turnip break. This doubles the period between two successive crops of potatoes, and tends to ensure the elimination of groundkeepers.

If pits are put on stubble fields, the part of the field on which the pits are situated should not be planted in the following year with potatoes intended for seed stock. It is desirable to pit each variety on the break on which it was grown ; two or more varieties should on no account be put in the same pit separated only by layers of straw. If there are pits of more than one variety together the greatest care should be exercised to prevent mixing. The same advice applies when there are pits of different stocks of the same variety. Where more than one variety of potatoes is grown in the same field, drills of swedes or turnips should separate the varieties, and the headrigs should also be sown with turnips. Headrigs should not be planted with a variety different from the main crop ; serious mixing has been known to occur through incorporating during earthing up the inner drill of the headrig which has been planted with another variety. Harrowings should always be pitted separately. Care should be taken that rogues are not introduced with manure. The feeding of small potatoes to court-fed cattle is a frequent cause of impure stocks ; in

* See p. 103.

the neighbourhood of large towns impurities in stocks are sometimes traceable to the use of dairy and piggery manure.

Many instances of the mixing of stocks due to the lack of observance of these precautionary measures have been reported to the Board. Very frequently the cause of impurity in a crop is the presence of groundkeepers resulting from too close a rotation. Planting over old potato pits is also a common cause of impurity.

Roguing in the Boxes.—The notes that follow deal chiefly with roguing in the field, but attention may be directed here to the desirability of roguing while the seed is in boxes. When the seed is boxed, much subsequent trouble can be avoided by examining it before planting, and discarding tubers whose characteristics, *e.g.* colour of sprout, colour of skin, shape, etc., are different from those of the variety to be planted.

Roguing in the Field.—As a rule, roguing of a crop cannot be effectively commenced until the flowering season, at which time the plants are well developed, are standing separate from their neighbours and are clearly exhibiting the foliage characteristics on which their identification chiefly depends.

Roguing by flower colour alone is seldom effective. Complete roguing of a crop is only possible by repetition of the operation several times throughout the season, and is dependent on rogues being removed immediately on detection, and on care being taken to lift out and collect all tubers of plants thus dug. Roguing is to be avoided during stormy weather and should not be done against the sun, as dull calm weather gives the best conditions for identification.

Methods of Identification.—Varieties may be identified in the field by reference to the following characters :—

I. The foliage.
II. The flower.
III. The date of maturity.
IV. The tuber (including the stolon and sprout).

Identification by the Shaw or Haulm.

Features in the shaw which are of service in identification are :—

(*a*) Habit and general appearance.
(*b*) Foliage.
(*c*) Stem.

The condition of the soil, the manuring, the season, etc., affect the degree of development of the foliage characteristics, but generally the relative effects on the varieties are similar. Foliage diseases, such as leaf roll, mosaic and crinkle, when present, alter the characteristics of the haulm more or less. Without a knowledge of the effects of each of the diseases on the foliage of each of the different varieties, it is impossible for any one to effect unfailing identification of varieties.

(*a*) The *habit and general appearance* are the most useful for roguing purposes. The habit may be tall or low set, upright or spreading, stiff and erect or drooping, open or compact, bushy or straggling, branching or non-branching, high or low branching, robust and strong growing or small and weak, with all gradations between these extremes. Towards maturity the haulms generally become straggling. The habit, in conjunction with the obvious foliage and floral characteristics, forms an eye picture of a variety which should as a rule be sufficient for its identification. Rogues can generally be picked out by their general appearance in contrast with the general appearance of the plants of the crop in which they are growing. Minor or less obvious characteristics are often of great value in identification, but they are of secondary importance.

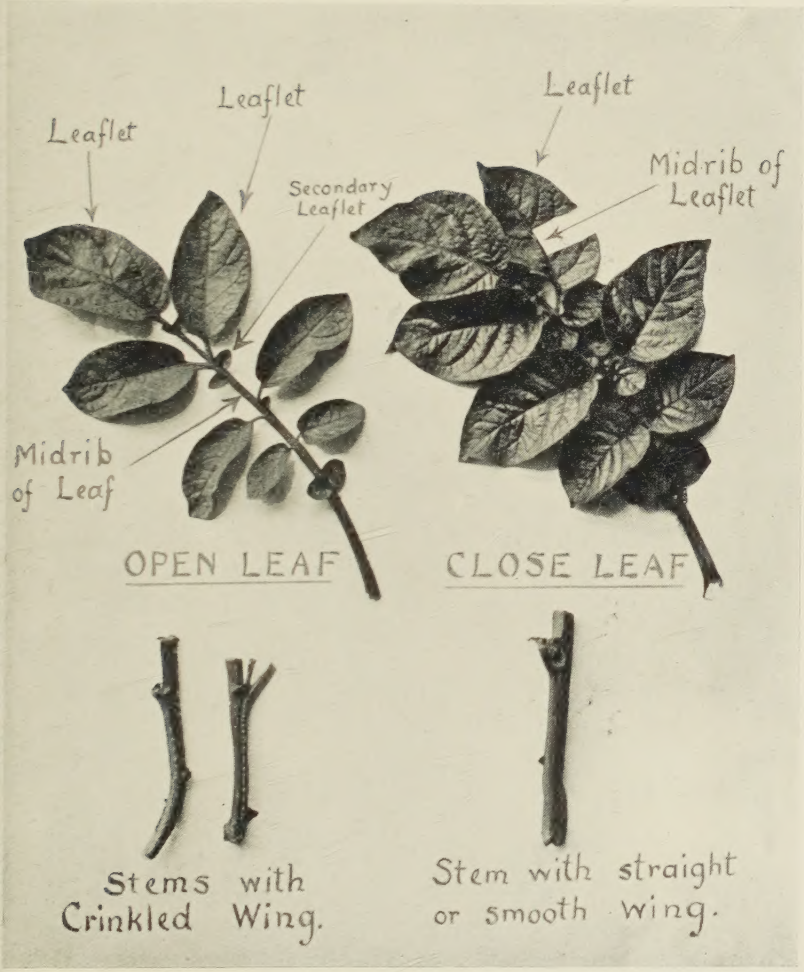
Tall-growing rogues in a low-set crop are easily detected, because they are conspicuous. Thus often the first indication of Arran Chief rogues in a crop of Ally is the fact that, here and there, plants are noticed standing distinctly above the average level of the crop. Similarly, Templar stands above Majestic, especially towards the end of the season. On the other hand, a low-set rogue in a tall-growing crop is often overlooked. Thus Eclipse in a crop of Langworthy and Reading Russet in a crop of Kerr's Pink are apt to be missed unless the crop is examined carefully.

(*b*) *Foliage.*—The reader should study the illustration (Plate I.) in order to make himself familiar with the following terms :—

(i) Leaf and Leaflet.—A potato leaf is a compound leaf, being composed of a number of leaflets and a number of smaller leaflets, called secondary leaflets.

(ii) Close Leaf and Open Leaf.—Whether a leaf is close or open depends partly on the distance between the leaflets, partly on the length of the leaflet stalk, and partly also on the size and number of the secondary leaflets. Closeness or openness of the leaf is often a

Plate I.



Crinkled Wing reproduced above is referred to in the text as waved wing.

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valuable distinguishing character, *e.g.* the leaf of British Queen is quite distinct from that of Abundance by reason of its openness.

(iii) Midribs.—There should be noted in particular, from the illustration, the distinction between the midrib of the leaf and that of the leaflet. The chief distinguishing feature in the midribs of the leaves is the amount of blue-purple or red-purple colouration present. Occasionally the colour in the midrib of the leaf extends into the midribs of the leaflets.

The leaf, according to the variety, may be light, dark, or grey-green in colour ; hairy, smooth, waxy, wrinkled, dull or glossy ; long or short ; rigid, spreading or drooping ; flat or with the side leaflets arched or drooping. The number of leaflets and of secondary leaflets varies according to the variety. The angle between leaf and stem is an occasional distinctive feature.

The leaflets also show varietal differences. They may be large or small, broad or narrow, apparently thick or thin. The terminal pair of leaflets may be pointed forward and overlapping the terminal leaflet, or set nearly at right angles to the midrib of the leaf. The leaflet stalk may be long or short, and it may or may not bear tiny leaflets ; the terminal leaflet may be drooping or rigid, and, in the young plant, it may be joined to one or both of the adjacent side leaflets.

(*c*) *Stem.*—The more obvious distinguishing points are the amount and nature of colouring, the thickness, hardness, branching or non-branching habit. The number of stems to each plant, and the length of internode (*i.e.* distance between the bases of two leaf stalks) may also be characteristic. One other feature of the stem is the occurrence of projecting ridges or wings which run down the stem, emphasising its angular character (see Plate I.). The wing may be smooth and straight, or it may be waved. This feature, though not so obvious as some of the other foliage characteristics, is often very valuable in confirming identification, *e.g.* in deciding whether a plant is Great Scot or Arran Chief. In the descriptions of varieties, mention is only made of the wing when it is waved ; in all other cases it is straight, or nearly so.

All common varieties have the stems hollow between the joints, with the exception of the variety Eclipse, which has solid stems until almost mature.

Identification by the Flower.

Potato flowers are white, purple or nearly blue.

White Flowers.—Shades of white may be described as creamy white (*e.g.* Majestic), white with green tips (*e.g.* Arran Chief) or milky white (rare, *e.g.* Nithsdale). Some white flowers may have tinges of colour on one or both surfaces.

Purple Flowers.—The identification of the shade of purple in potato flowers often presents difficulty. Purples may be predominantly red or predominantly blue, or of almost any intermediate shade. Coloured flowers fade soon after exposure, and faded red-purple flowers may actually appear to be blue-purple. In order to determine shades of purple with certainty the flowers should be examined soon after they are fully expanded. The examinations should not be made in direct sunlight.

Blue Flowers.—No potato flowers are pure blue, but there are a few varieties the colour of whose flowers appears to be nearer to a pure pale blue than any other colour (*e.g.* Sharpe's Victor).

The area of the flower to be utilised in distinguishing shades of colour is the part between the centre and the tips of the flowers. The colour chart should be used as a standard. Coloured flowers, according to variety, have a variable amount of white on the tips. On some varieties the tips are merely of a lighter shade. Minor floral characteristics which may distinguish varieties or which may confirm identification are :—Size and shape of flower ; profusion of blossom ; number of flower tips ; development and colour of the anthers ; length and colour of style ; length of sepal tip ; hairiness and colour of buds ; colour of bud bases ; size, frequency and persistency of buds ; length and thickness of flower stalks ; colour of flower stalks ; hairiness of flower stalks ; leafiness of flower stalks ; natural production of berries.

These are not to be regarded as main characters, and should only be used when other means of distinction fail.

Many varieties are non-flowering or have flowers which very seldom open out. In some of these varieties the characteristics of the flower stalks and buds may be useful as a guide to identification by comparison.

A flowering rogue in a non-flowering crop, or in a crop whose flowers are of a different colour, is easily detected. On the other hand, a non-flowering rogue in a flowering crop may easily escape notice, a plant without a flower being less con-

LIGHT RED PURPLE

RED PURPLE

DARK RED PURPLE

LIGHT BLUE PURPLE

BLUE PURPLE

DARK BLUE PURPLE

LIGHT BLUE

9·52 W1 P.53 1006 5000 527

H.M.S.O., Cr., Lith.

spicuous. Indeed, plants in a strong close-growing crop have sometimes to be separated from each other by hand in order that it may be decided to which plant a flower belongs. In such cases the rogues would generally be detected more readily by foliage differences. Again, both crop and rogue may belong to varieties that seldom flower, or the flowers of crop and rogue may be similar. The grower should, therefore, consult the descriptive notes in order to find out in what way flowers are likely to be of service in the roguing of his particular crop.

Identification by the Date of Maturity.

A plant is considered to be mature when the haulm is wilting and the stem can be easily detached from the underground parts. An arrangement of four groups has been adopted here, viz. First Early, Second Early, Early Maincrop and Late Maincrop. The limits of each group are determined with reference to a standard variety of each class of maturity, Duke of York being chosen as the standard First Early, British Queen as the standard Second Early, Majestic as the standard Early Maincrop and Up-to-Date as the standard Late Maincrop. Roguing becomes extremely difficult when certain rogues commence to mature before the variety in which they occur, thereby losing distinctive habit and characteristics, *e.g.* Royal Kidney in a crop of Great Scot. An early rogue in a late crop, or *vice versa*, when the rogue is not easily distinguished otherwise, is often easily rogued out of the crop when the haulm of the earlier variety goes down. Unfortunately the work of inspection for the purpose of official certification must necessarily be so arranged that some growers will not be able to postpone roguing long enough to avail themselves of this method. On the other hand, if the percentage of rogues has been sufficiently low to justify the granting of a certificate, it is well worth while to remove these rogues later, when the difference in the date of maturity makes roguing easy. This will improve the stocks for the following year. Even early in the season, difference in date of maturity may sometimes be an aid in roguing. The presence of rogues in a late crop may be indicated by random plants which come into flower before the bulk of the crop, *e.g.* British Queen in a crop of Rhoderick Dhu.

Identification by Tuber and Sprout.

Tuber.—The characteristics of the tuber are obviously only of service in confirming identification based on the appearance of the foliage and flowers. The point of attachment of the tuber to the stolon is called the heel or stem end ; the other end, about which the eyes are generally clustered, is known as the rose end. Tuber shapes have been classed here into three groups :—round, oval (including oblong) and kidney (which includes long oval and pear-shaped types). Tubers in all classes have, according to variety, varying degrees of thickness. It is often difficult, particularly from examination of a single plant in the field, to determine the characteristic shape of tubers of any particular variety. Tubers may vary from round to oval or from oval to kidney even on the same plant. There is usually a clear distinction between round and kidney. The predominating tuber shape of any variety can be judged only from examination of bulk samples of large tubers, although the immature tubers of certain varieties are quite characteristic, *e.g.* British Queen. Round tubers are approximately spherical, *e.g.* in Champion, Epicure. They may be slightly flattened as in Great Scot, Arran Comrade, Rhoderick Dhu, President. Oval tubers have greater length than breadth. They may be either (*a*) true oval or approximately oblong in outline, having their greatest width near the middle, *e.g.* in Up-to-Date or Sutton's Abundance, the tubers of which varieties tend to flatness, or in Early Market, the tubers of which are thickened, or (*b*) pointed, *i.e.* thickened, and tapering from the heel end to the rose end, *e.g.* in British Queen. Within the latter type many tubers are oblong. " Kidney " tubers are distinctly long ; they may be long oval, broadest in the middle, *e.g.* in Witchhill (flat) ; or they may taper from the rose end to the heel (pear shaped), *e.g.* in Duke of York (thick). Other tuber characteristics are :—colour of skin, colour of flesh ; depth, number, position and nature of eyes ; colour of scale leaves (the tiny leaflets on the eyebrows).

Frequently also the appearance of the runners is useful in determining identity. The chief distinguishing feature of the runners is the colour, but length and profusion are sometimes characteristic, as in Templar. The amount and type of second growth (outgrowths from the eyes, irregular tubers, cracking and hollowness) sometimes give a clue to the identity of a variety. With regard to the position of the eyes, the

cluster may be either on the point of the tuber, as in British Queen, or it may be some distance from the point, in which case the eyes are said to be on the shoulder, as in Great Scot. In some varieties, *e.g.* British Queen and Early Market, the side eyes, *i.e.* those away from the cluster, have a distinct swelling on the eyebrows, in which case the eyes are said to have raised eyebrows.

Sprouts.—Assistance in identification by reference to the colour of sprouts is available chiefly in the store when the tubers have been sprouted in boxes before planting. Any colour on the underground parts of a growing plant, *e.g.* on the runner, on the heel of the tuber, on the scale leaves at the eyebrows, in or about the eyes as well as on the skin of the tuber corresponds to the colour of the sprout and may on occasion be of service in confirming identity. The colour of the sprout may be (1) faint pink, *i.e.* the sprout is white or greenish white with green tips, but generally shows a little pink at the base and at the tip, increasing on exposure ; (2) pink—varying from pink to carmine, generally on a white or greenish white ground, the colour at the tip being similar to the colour at the base ; (3) blue or blue-purple when the tip and base are always a shade of blue and when generally the whole sprouts become so coloured. The colours utilised for identification are those which appear when the tubers are sprouted in diffuse light ; when sprouting is induced in full daylight the colours soon become darker and more difficult to distinguish. Colour is always more intense on the minute breathing pores on the skin (lenticels).

Further notes on Roguing.

Identification for the purposes of roguing or of assessing the purity of a crop should be systematic. The problem presented by each crop will necessarily vary. The appearance of healthy, free-growing plants of the variety under consideration may differ from the appearance of similar plants in another environment. The identity of the crop itself should, therefore, first be verified, reference being made, if necessary, to the printed description of the variety. Variations from the type which are due to foliage diseases, inequalities of soil, of fertility or of manuring frequently occur. The best way to identify varieties is to know them by headmark. The complete appearance of a typical plant of the variety, including outline, habit (see p. 6) and the peculiarities of the foliage in

mass (see p. 6), as well as the class of maturity (see p. 9) and character of tuber (see p. 10), independently of the flower, even in free-flowering varieties, should therefore be memorised by eye, so that the differences exhibited by rogues may be readily detected. Similarly, the complete appearance of any rogue, independently of its flower, should be memorised whenever it is detected, particularly in comparison with the plants of the crop, in order to facilitate ready recognition in the event of its recurrence. Even in free-flowering varieties absolute dependence cannot be placed on the flower as a sure means of recognition. Occasional plants may be past flowering, and rogues may have the same colour of flower as the crop. Reference to the tubers may be of assistance in distinguishing rogues when the tuber is distinctly different from that of the variety under examination (see p. 10).

The individual characters which, in general, either singly or in combination, are of the greatest service for detection by comparison are :—height, strength of growth and amount of cover, colour of foliage, stiffness or droop of leaves, degree of openness of leaf, degree of brightness of leaf, shape of leaflet, class of maturity, colour of flower, colour of flower buds, shape and colour of tuber and colour of tuber flesh. A single prominent and consistent feature is frequently sufficient indication of a rogue. Points of detail may be of service for purposes of confirmation, but are generally only important in distinguishing between two varieties which are nearly alike.

II.—STANDARD COMMERCIAL VARIETIES (DESCRIPTIONS, WITH SHORT DETAILS OF THE ROGUES OF EACH).

In these notes the use of technical terms and phrases has been avoided as far as possible ; terms used out of their common significance have been explained in the introductory matter. Full descriptions are given of the principal commercial varieties, the more important features in heavy type. Descriptions of the less important commercial varieties, and of varieties which occur only as rogues, will be found in the Sections III. and IV., pp. 53 and 77 respectively. To each variety described is appended a list of names of varieties which are known to occur most frequently in Scotland as rogues in stocks of that variety, and a note of the chief points of difference between the rogue and the variety described is

given. This list of rogues is in no case exhaustive; a crop may contain any other variety as a rogue.

The rogues of most frequent occurrence in any crop are generally plants of other standard varieties, namely, Up-to-Date, Early Market, Arran Chief, British Queen, Royal Kidney, Champion, Northern Star, Evergood, King Edward VII., Sutton's Abundance, Eclipse, President, Epicure and (in earlies) Myatt's Ashleaf. Some well-known varieties, which are long out of date and almost out of cultivation, persist with great frequency as rogues, *e.g.* Magnum Bonum, Lymm Gray, Beauty of Bute, Rocks and John Bull; while some varieties of unknown origin are almost as common, *e.g.* "Blue Gloss," "Blue Grey," "Bravo," "Burnhead Rogue." Of all these the three most common are Up-to-Date, Arran Chief and Early Market.

The rogues in first early varieties are the common first early varieties and Myatt's Ashleaf, while the common late sorts also occur frequently. The presence of Royal Kidney is frequently noted. Stocks of Epicure are largely mixed with Fiftyfold and to a lesser extent with Sutton's Early Regent, Nonesuch, Conquest and the "Mosaic Rogue."

Types.—Varieties are said to belong to a standard type when they are indistinguishable in their botanical characters from that established type. Undoubtedly many so-called varieties are simply selections from an established standard variety, but the possibility of the reconstitution of a standard variety in a new seedling, whether produced by artificial cross-fertilization or natural self-fertilization, is recognised. For lists of varieties similar to certain standard types see the Board's "List of Names of the Varieties of the Potato." *

ALLY (Mackelvie) (Immune).

Maturity.—Early Maincrop.

Tuber.—Round to oval (flat); skin yellow; eyes shallow, saucer-shaped, few, close together, and on the shoulder; flesh white; sprouts faint pink. Second growth takes the form of cracking.

Foliage.—Haulm of medium height, **spreading, dark grey-green**; stems green; **leaflets long and hairy, with a dull thick appearance,** towards maturity becoming rather glossy;

* Miscellaneous Publications No. 4 (Board of Agriculture for Scotland, price 2s. 6d. post free).

secondary leaflets inconspicuous. Terminal leaflet often joined to one or more laterals.

Flower.—White ; anthers generally lemon coloured, and malformed. Buds green with a pink tinge.
Bolters occur.

N.B.—The variety Allies must not be confused with Ally. Allies is non-immune and is identical with Northern Star.

Rogues.	See Page	Distinguishing Characteristics.
		Flower coloured.
Up-to-Date* . .	50	Foliage lighter ; late.
		Foliage light green.
Eclipse . . .	24	Stems pink tinged and solid ; early.
Early Market . .	82	Non-flowering.
		Foliage rigid.
British Queen* .	18	Leaflets brighter.
Summit* . .	93	Haulm tall and open ; leaflets small ; late.
Arran Chief . .	15	Haulm tall ; wing waved ; leaves wrinkled.
Northern Star .	44	Haulm tall ; leaflets smaller, more pointed ; tuber with a pink eye.
		Various.
Marquis of Bute .	86	Foliage brighter green ; leaflets broader, secondary leaflets numerous, conspicuous ; eyes of tuber pink, deep.
King Edward VII. .	34	Haulm tall and upright ; foliage tops with small, narrow, dark green leaflets, distinctly twisted forward ; tuber white, splashed pink.

* Denotes free-flowering.

ARRAN CHIEF (Mackelvie) (Non-immune).

Maturity.—Late Maincrop.

Tuber.—Round (somewhat flat), skin white, **with usually a purple spot at the heel during the growing season**; eyes medium; flesh white; runners showing a blue-purple coloration; sprouts blue.

Foliage.—Haulm upright and tall, stem mottled blue-purple, **stem wing distinctly waved**; leaf moderately open, **dull and rigid**; leaflets medium to dark green, wrinkled; margins waved; **terminal leaflet not drooping.**

Flower.—White, with green tips, infrequent; anthers malformed and pale; **buds distinctly pale green,** becoming slightly darker towards maturity and borne on short stalks.

Rogues.	See Page.	Distinguishing Characteristics.
		Flower coloured.
Up-to-Date*	50	—
Langworthy*	37	Haulm open; stems straight.
Champion*	20	Stems thin, purple and numerous.
Beauty of Bute*	77	Wings straight and broad; leaflets lighter green with well-marked light-coloured veins.
John Bull	84	Leaf upright, leaflets cupped.
Blue-Grey	78	Stems numerous and slender; leaflets light grey-green.
Blue Gloss*	77	Leaflets glossy and drooping.
Blue President Rogue*	78	Buds dark; tuber with blue markings.
Myatt's Ashleaf Rogue*	91	Stems numerous; berries profuse.
Bravo*	79	Stems thin and numerous; leaf open, leaflet light green.
		Flower White.
British Queen*	18	Foliage bright.
Abundance*	48	Buds dark; leaf close and glossy.
Summit*	93	Buds dark; haulm open; leaf short and open with pink on midrib.

* Denotes free-flowering.

Rogues.	See Page.	Distinguishing Characteristics.
		Foliage light green.
Up-to-Date* . .	50	See above.
Early Market . .	82	Leaflets round.
Burnhead Rogue .	80	Flower buds dark ; haulm bushy; secondary leaflets very small.
Bravo* . .	79	See above.
Blue-Grey . .	78	See above.
		Various.
Northern Star .	44	Leaves with pink tinge on midrib ; leaflet small, narrow and pointed ; tubers with faint pink eyes.
Evergood . .	27	Flower buds pink ; foliage tops drooping ; leaflets narrow and waxy.
Lymm Gray . .	85	Foliage tops drooping ; leaf with pink midrib and of soft appearance ; heel of tuber pink.

* Denotes free-flowering.

ARRAN COMRADE (Mackelvie) (Immune).

Maturity.—Second Early.

Tuber.—Round, somewhat flat ; skin white ; eyes shallow on the shoulder ; flesh white ; sprouts blue.

Foliage.—Haulm of medium height, spreading and **compact,** with drooping tops, especially towards maturity. Leaf fairly open and drooping. Leaflet medium to dark green, top **leaflets dull** and soft ; secondary leaflets conspicuous.

Flower.—White, occurring fairly freely. Flower stalk very long. Buds green, with pink markings.

Rogues.	See Page.	Distinguishing Characteristics.
Blue Gloss* . .	77	Flower blue-purple ; stems thin ; leaflets small and glossy.
British Queen* .	18	Foliage rigid ; tuber oval pointed.
Abundance* . .	48	Leaf closer ; heel of tuber purple.

* Denotes free-flowering.

Rogues.	See Page.	Distinguishing Characteristics.
Arran Chief . .	15	Haulm taller ; foliage rigid and wrinkled ; stem wing waved ; heel of tuber purple ; late.
Great Scot . .	28	Haulm more open ; top foliage glossy.
Burnhead Rogue .	80	Flower blue-purple, infrequent ; habit branching ; leaf rigid ; leaflets dull light green.
Rogue like Entente .	90	Non-flowering ; haulm low ; stems numerous, thin and blue-purple ; leaf very open ; leaflets markedly narrow and pointed.

* Denotes free-flowering.

ARRAN CONSUL (Mackelvie) (Immune).

Maturity.—Early Maincrop.

Tuber.—**Oval, oblong** ; skin white ; eyes shallow, but deep on large tubers ; flesh white ; sprouts pink.

Foliage.—**Haulm tall and open** ; stems branching, tinged pink ; wings waved at tops ; leaf **markedly open,** long ; leaflets medium to dark green, with well-marked light-coloured veins, **thick** with **long stalks** ; secondaries often borne on leaflet stalks.

Flower.—**White, very infrequent** ; buds dark.

ARRAN VICTORY (Mackelvie) (Immune).

Maturity.—Late Maincrop.

Tuber.—**Round (somewhat flat)** ; **skin blue-purple** ; eyes medium ; eyebrows long ; flesh white ; sprouts blue.

Foliage.—Haulm upright, tall ; stem purple ; leaf with purple midrib ; leaflets **medium to dark green and glossy** ; **terminal leaflet drooping to the perpendicular**.

Flower.—**Creamy white** ; **of free occurrence,** with long sepals ; buds purple, very hairy.

White Arran Victory is similar to Arran Victory, but the skin of the tuber is white, with purple markings.

BISHOP (Wilson) (Immune).

Maturity.—Late Maincrop.

Tuber.—Kidney (pear-shaped), thick; eyes small, shallow and on the point; skin white; **flesh yellow**; sprouts pink.

Foliage.—Haulm tall, strong, **upright and open**; stem mottled with dark pink. **Leaf rigid,** wings wavy at tops; leaflets medium green, **large and long**, with a touch of pink at the base of the leaflet stalk at the early stages; secondary leaflets large.

Flower.—Profuse; **dark red-purple, tipped white**; blossoms borne on long stalks well above the plant; buds dark red-purple; sepals short and narrow, pointed; stigma protruding from the bud; style long; half-opened flowers deep red.

BRITISH QUEEN (A. Findlay) (Non-immune).

A very large number of so-called varieties of the British Queen type are known. Some of the commoner are :—Maid of Auchterarder, M'Pherson's Early, Robson, Pioneer, Pioneer Queen, English Beauty.

Maturity.—Second Early.

Tuber.—Oval to oval pointed; skin white; eyes medium and on point of tuber; **eyes on sides of tuber having eyebrows long and raised**; flesh white; sprouts pink.

Foliage.—Haulm of medium height, spreading; stems tinged red-purple, branching; **branches rigid,** wings slightly waved at the tops. **Leaf open and rigid**; leaflet broad, medium to dark green and bright; end pair do not overlap the terminal.

Flower.—Creamy white, large and profuse; flower stalks bronze coloured; buds dark.

Rogues.	See Page.	Distinguishing Characteristics.
		Flower coloured.
Up-to-Date* . .	50	Foliage lighter green; late.
Champion* . .	20	Stems numerous, thin and dark; late.
Blue Gloss* . .	77	Leaflets drooping.

* Denotes free-flowering.

Rogues.	See Page.	Distinguishing Characteristics.
		Non-flowering or seldom flowering.
Epicure . . .	26	Haulm with drooping tops; leaflets narrow; early.
Duke of York . .	23	Haulm smaller, more open; leaflets thick and dull; flesh yellow; early.
Evergood . .	27	Foliage tops drooping; leaflets narrow and waxy.
Arran Chief . .	15	Haulm tall; leaflets dull and wrinkled; buds green; late.
Early Market . .	82	Leaf light green, dull; leaflets wrinkled.
		Various.
Abundance* . . .	48	Haulm taller, leaf close; heel of tuber faint blue-purple.

* Denotes free-flowering.

CATRIONA (A. Findlay) (Immune).

The stocks officially tested as Torquil are identical with the stocks officially tested as Catriona.

Maturity.—Second Early.

Tuber.—**Kidney (long oval)**; **skin yellow, blue-purple in the eyes and about the eyes**; eyes shallow and on the point; flesh soft, white, with a **lemon** tinge; sprouts blue.

Foliage.—Haulm of medium height, **compact, spreading and vigorous**; **stem branching freely,** with occasional colour on tops; wings waved; leaflets **medium to dark green,** with waved margins, glossy and semi-drooping, the last pair fitting round the terminal; secondary leaflets numerous.

Flower.—**Light blue-purple, tipped white,** fairly frequent; buds dark.

Mosaic disease is very common in stocks.

Two substitutes are known—both have purple markings on the tubers.

	See Page.	Distinguishing Characteristics.
Substitute 1* . .	80	Flower darker; haulm taller and more upright; stems more deeply coloured; leaflets duller and more rigid; tubers round; flesh white.
Substitute 2 . .	81	Flower less frequent; haulm taller and more upright; base of stem deeply coloured; tubers round; flesh white.

* Denotes free-flowering.

CHAMPION (Nicol) (Immune).

Maturity.—Late Maincrop.

Tuber.—**Round, irregular, distinctly dented at heel**: skin white; **often with a blue-purple splash at the heel in the growing season,** and other blue-purple markings: **eyes very deep**; **flesh yellow**; runners numerous, blue-purple; sprouts blue.

Foliage.—Haulm erect, **very tall with bushy habit,** and a **profusion of thin hard branches which are markedly mottled purple**; **leaf open**; **leaflets dull, narrow,** medium to dark green, and rather small; secondaries inconspicuous; bases of leaflet stalks tinged blue-purple.

Flower.—**Dark blue-purple, distinctly tipped white—frequent**; buds dark and profuse; berries occasionally occurring.

Rogues.	See Page.	Distinguishing Characteristics.
Up-to-Date* . .	50	Flower red-purple, tipped a lighter shade; haulm spreading and compact; leaflets larger and lighter green.
John Bull . .	84	Flower red-purple, tipped white; leaf upright, brighter; leaflets cupped; secondaries fairly numerous.

* Denotes free-flowering.

Rogues.	See Page.	Distinguishing Characteristics.
Date Rogue like Champion* . .	82	Flower blue-purple, larger, not distinctly tipped white; leaflets lighter green, broader, with waved margins; berries very frequent; tuber flesh white.
Rocks . . .	89	Seldom flowering; stems green; leaf upright; leaflets small, markedly wrinkled.

* Denotes free-flowering.

CRUSADER (Wilson) (Immune).

Maturity.—Second Early.

Tuber.—**Kidney (pear shaped)**; skin white; eyes shallow, saucer shaped, usually on the shoulder, those on the sides with slightly raised eyebrows; flesh white; sprouts faint pink.

Foliage.—Haulm of medium height to tall, upright, robust, **compact**; wings waved at the top, stems tinged red-purple towards maturity; leaf dark, glossy, **arched and markedly wrinkled, fairly close with drooping leaflets, giving leaf a half-closed fist appearance.** The last pair of leaflets fits over the terminal leaflet.

Flower.—Red-purple, tipped white; sometimes occurring fairly freely; buds pink, with a green base.

Rogues.	See Page.	Distinguishing Characteristics.
Ally . . .	13	Flower white; leaf open; leaflet dull, grey-green; tuber round, flat.
Rogue like Southesk	91	Flower white; leaves rigid, open; leaflets dull, pointed, with waved margins; tuber round.
Rogue like Templar .	92	Flower white and large; leaves open and rigid; tubers oval.

DARGILL EARLY (Gardiner) (Immune).

This variety is identical with Boston Kidney and Mitchell's Advance.

Maturity.—Second Early.

Tuber.—Kidney (pear-shaped); skin pale yellow; eyes shallow, those on the side having raised eyebrows; **flesh yellow**; sprouts faint pink.

Foliage.—Haulm of medium height, spreading; **leaf open**; leaflets **dark green, glossy and cupped, with arched appearance** and not pointed forward. Leaflet stalks long, often bearing small leaflets.

Flower.—Light red-purple, seldom formed. Flower stalk short.

Rogues.	See Page.	Distinguishing Characteristics.
Myatt's Ashleaf*	69	Flower blue-purple, tipped white; berries frequent; flower buds darker and more frequent; stems blue-purple.
British Queen*	18	Flower white.
Eclipse	24	Stem solid; leaflets dull, light green, small and round.
Sharpe's Express	47	Leaf close, with crowded secondary leaflets; end pair of leaflets pointed forward.

* Denotes free-flowering.

DI VERNON (A. Findlay) (Immune).

Maturity.—First Early.

Tuber.—Kidney (long oval); skin yellow, **mottled blue-purple, especially at rose end**; eyes shallow **blue-purple**; flesh white, with tinge of lemon; sprouts blue.

Foliage.—Haulm low, spreading and **later becoming prone,** with drooping top; stem becoming mottled red-purple; wings slightly waved; leaf open; **leaflets thin, drooping, dark green and glossy**; the last pair generally overlapping the terminal, limp when ripening; secondary leaflets small and numerous. Towards maturity the margins of the **leaflets frequently curl upwards.**

Flower.—**Blue-purple, tipped white** ; stalk long, tinged purple ; buds dark blue-purple.
A substitute is known—the tubers have purple markings.

Rogues and Substitutes.	See Page.	Distinguishing Characteristics.
Catriona Substitute 2	81	Taller ; lighter green ; rigid leaves ; round tubers.
Catriona . .	19	Taller ; leaf closer ; buds lighter coloured.
Katie Glover .	31	Bushy ; foliage light green ; buds clustered and woolly.

DUKE OF YORK (MIDLOTHIAN EARLY) (Sim) (Non-immune).

Maturity.—**First Early.**

Tuber.—**Kidney (pear-shaped)**, thick ; skin yellow, rough at maturity ; eyes very shallow and on the point ; **flesh yellow** ; sprouts faint pink.

Foliage.—Haulm of **low** to medium height ; **open and straggling** ; **leaf open and long** ; leaflets medium green, **dull, thick and long.**

Flower.—White, seldom formed ; anthers pale and malformed ; buds with long green tips.
Bolters occur.

Rogues.	See Page.	Distinguishing Characteristics.
		Flower coloured.
Myatt's Ashleaf* .	69	Berries numerous ; habit taller ; stems purple coloured ; leaflets smaller, generally affected with mosaic.
Sharpe's Victor* .	74	Leaf rigid ; leaflets rounded ; tuber oval.
		Various.
British Queen* .	18	Leaf bright and rigid ; later.
Royal Kidney .	46	Haulm taller, with drooping tops ; leaves darker, with a tinge of pink in the midribs ; tuber white fleshed ; later.

* Denotes free-flowering.

Rogues.	See Page.	Distinguishing Characteristic .
Sharpe's Express	47	Leaf bright and crowded.
Eclipse . . .	24	Leaflets small, rounded, light coloured ; stems pink tinged, solid ; tuber white fleshed.
Rogue like May Queen . .	91	Stems mottled blue-purple ; leaf rigid ; leaflets large, oblong, glossy, cupped ; tubers oval.
Stirling Castle .	93	Haulm taller ; secondary leaflets numerous and often on leaflet stalks ; tuber oval ; flesh white.
Witchhill . .	52	Haulm more compact ; leaflets thin, glossy, curling upwards at margins towards maturity ; tuber white fleshed.

ECLIPSE (SIR JOHN LLEWELYN) (Harris) (Non-immune).

Maturity.—First Early.

Tuber.—Oval to oval pointed ; skin white ; eyes shallow and almost on the point ; flesh white ; sprouts pink.

Foliage.—Haulm of medium height and spreading ; stems **pink in colour and solid before maturity** ; wings waved ; leaflets **broad, small, dull, light to medium green.** There is a pink tinge at the base of the leaflet stalks, and on the margins of the leaflets, at an early age.

Flower.—White, infrequent, ; buds hairy and dark pink, with green tips.
Bolters frequently occur.

Rogues.	See Page.	Distinguishing Characteristics.
British Queen* .	18	Foliage rigid and bright ; second early.
King George V.* .	36	Leaf more drooping, leaflets soft ; second early.
Sharpe's Express .	47	Leaf bright and crowded.

* Denotes free-flowering.

Rogues.	See Page.	Distinguishing Characteristics.
Royal Kidney .	46	Haulm taller, with drooping tops; leaf dark.
Epicure . . .	26	Upright, with drooping tops; leaflets dark, narrow and glossy.
Evergood . .	27	Upright, with drooping tops; leaflets dark, waxy and narrow; early maincrop.
Early Market . .	82	Leaf rigid, closer; eyes deep; early maincrop.

EDZELL BLUE (Immune).

Maturity.—Second Early.

Tuber.—Round: **skin blue-purple**: eyes medium to deep, eyebrows distinct; flesh snow white; sprouts dark blue.

Foliage.—Haulm of low to medium height—upright, spreading later; mottled blue-purple towards maturity. **Leaf open and drooping, midrib purple at base and bases of leaflet stalks. Leaflet ashy green and dull.**

Flower.—White, but sometimes with a tinge of light blue-purple; **occurring freely**; buds dark.

Rogues.	See Page.	Distinguishing Characteristics.
Eightyfold* . .	82	Flower pale blue; stems and midribs deeply coloured; leaflets large, round and bright; tubers pale blue-purple.
Fortyfold . .	83	Non-flowering; stems numerous; leaf small, leaflets small; generally mosaiced; tuber splashed blue-purple; buds green; late.
Blue Northern Star .	78	Haulm taller, closely resembling Northern Star; leaf rigid; buds green; tubers splashed purple.

* Denotes free-flowering.

EPICURE (Clark) (Non-immune).

Maturity.—First Early.

Tuber.—Round, irregular; skin white, but turning pink on exposure; eyes deep, ridged, with raised eyebrows; flesh white; sprouts pink.

Foliage.—Haulm **upright,** rather robust and tall for an early; leaf **dark, glossy, drooping**; leaflets long and **narrow,** the last pair having waved margins, and pointing forward to overlap the **terminal which droops.** The stem develops a **pink colour.**

Flower.—White, not blooming freely; buds dark, with green tips.

Bolters occur.

Rogues.	See Page.	Distinguishing Characteristics.
		Flower coloured.
Champion*	20	Stems numerous, purple; late.
Beauty of Bute*	77	Haulm tall; the leaflets have light green veins and downward-turned margins; tubers white, with pink markings; late.
John Bull*	84	Leaf upright, rigid; tubers white, with pink markings; late.
Up-to-Date*	50	Late.
		Foliage lighter green.
Up-to-Date*	50	Late.
Early Market	82	Haulm compact; leaf rigid; leaflets round, wrinkled; later.
Eclipse	24	Leaf dull; leaflets rounded; stem solid.
Conquest	81	Haulm compact; leaflets markedly arched and drooping.
White Fortyfold (Regent)	83	Buds green; stems green; leaf short; leaflets small, wrinkled.
Sutton's Early Regent	93	Haulm lower and more spreading; secondary leaflets round and numerous.
Mosaic Rogue*	87	Berries profuse; buds green; stems numerous and thin.

* Denotes free-flowering.

Rogues.	See Page.	Distinguishing Characteristics.
		Various.
British Queen*	18	Leaf rigid.
Fiftyfold*	83	Haulm more spreading and branching ; leaf rigid ; leaflets dull and hairy ; secondary leaflets large and numerous ; berries frequent.
Lymm Gray	85	Haulm more compact ; midrib of leaf with purple tinged spots ; leaflets dull and soft.
Nonesuch	87	Leaf close and short, with a half-closed fist appearance ; leaflets wrinkled and markedly drooping.

* Denotes free-flowering.

EVERGOOD (A. Findlay) (**Non-immune**).

Maturity.—Early Maincrop.

Tuber.—Oval, flat ; skin white ; eyes shallow, on point ; flesh white ; sprouts faint pink.

Foliage.—Haulm erect, with drooping tops ; leaf open ; **leaflets narrow,** pointed, **dark green with a thick, waxy appearance.**

Flower.—Light red-purple, very seldom formed ; buds pink.

FIELD-MARSHAL (Stratton) (**Non-immune**).

For description see Up-to-Date.

GOLDEN WONDER (Brown) (**Immune**).

For description see Langworthy.

GREAT SCOT (Mair) (Immune).

Maturity.—Early Maincrop.

Tuber.—Round (somewhat flat), heel generally dented; skin pale yellow, but during growing season white at the eyes; eyes shallow to medium, saucer-shaped, and on shoulder of tuber; flesh white; sprouts deep pink.

Foliage.—Haulm tall, **upright.** Leaves fairly open, **glossy and dark**; leaflets thin, **the end leaflet drooping to the perpendicular.** Stem deep pink at the base, and not branching freely above ground.

Flower.—White, but frequently dropping off unopened, except in Bolters, which generally flower; anthers pale; buds dark.

Bolters common.

Sefton Wonder is identical with Great Scot, but the skin of the tuber is russet.

Rogues.	See Page.	Distinguishing Characteristics.
		Flower coloured.
Up-to-Date*	50	Foliage light green; late.
President*	44	Foliage light green, rigid; leaflets larger; late.
Langworthy*	37	Leaflets markedly wrinkled; tuber kidney (pear-shaped); late.
Champion*	20	Stems numerous, thin and purple; late.
Beauty of Bute*	77	Leaf rigid, ashy green, veins light green, prominent.
Peachbloom*	88	Anthers loose; stems numerous; wings waved; tubers splashed red.
Tinted flowered Rogue*	94	Flower stalks long; haulm spreading; leaf very open; leaflets rounder; earlier.
John Bull*	84	Leaf rigid; leaflets cupped.
Blue Gloss*	77	Stems mottled blue-purple; branches thin; leaf short.
Blue Grey	78	Haulm with many thin branches; leaf short, open, rigid; leaflets light grey-green, dull, hairy.

* Denotes free-flowering.

Rogues.	See Page.	Distinguishing Characteristics.
		Foliage light green.
Eclipse . . .	24	Foliage dull; leaflets small, round; stems solid; tubers oval pointed; early.
Early Market . .	82	Haulm lower; foliage dull; leaflets small, round, wrinkled, rigid.
Burnhead Rogue .	80	Leaves open, rigid; leaflets large, dull; secondary leaflets rare.
Blue Grey . .	78	See above.
Templar* . .	74	Stems mottled; berries frequent.
		Foliage dull, rigid.
Northern Star .	44	Leaflets smaller, more pointed; tuber with a faint pink eye; later.
Arran Chief . .	15	Terminal leaflet not drooping; stem wings waved; tuber blue at heel; later.
		Foliage tops drooping.
Royal Kidney .	46	Top foliage dull; leaves with pink on midribs; secondaries project upwards; tuber kidney.
Evergood . .	27	Leaf open; leaflets pointed, waxy; tubers oval, flat.
King Edward VII. .	34	Foliage tops small, narrow; leaflets distinctly twisted forwards, tuber kidney (pear shaped), splashed pink.
Epicure . . .	26	Haulm not so tall; leaflets narrower; stems pink; tubers coarse, deep-eyed; early.
Lymm Gray . .	85	Haulm compact; foliage tops soft, dull; leaf midribs pink; tuber pink at heel; small deep eye.
		Various.
British Queen* .	18	Haulm lower, leaf rigid.
Abundance* . .	48	Leaf close, heel of tuber blue-purple.
Arran Comrade* .	16	Upper foliage dull and soft; earlier.

* Denotes free-flowering.

IMMUNE ASHLEAF (Immune).

This variety is identical with the German variety Juli.

Maturity.—First Early.

Tuber.—**Kidney (pear-shaped)** ; skin white ; eyes on point of tuber, shallow, on sides, often with raised eyebrows ; **flesh yellow** ; sprouts blue ; scale leaves sometimes blue.

Foliage.—Haulm of medium height, spreading ; stems only slightly tinged purple at maturity ; wings not well marked ; leaf open, **markedly long** and spreading, leaflets light to medium green, **long, thin and pointed** ; terminal leaflet sometimes joined to a lateral leaflet or leaflets, especially in older leaves ; **secondary leaflets projecting upwards.**

Flower.—**Light blue-purple** ; buds dark.

Rogues.	See Page.	Distinguishing Characteristics.
Myatt's Ashleaf* .	69	Leaf rigid and short ; leaflets small, mottled ; berries profuse.
Dargill Early . .	22	Leaf rigid ; leaflets short, dark and glossy.
Harbinger . .	84	Low growing ; leaflets very large, light green ; tuber round.
Eclipse . . .	24	Leaflets smaller, lighter green, rounded ; stem solid.
Duke of York . .	23	Leaflets thick looking ; secondaries less conspicuous.

* Denotes free-flowering.

IRISH QUEEN (Strain) (Immune).

Maturity.—Late Maincrop.

Tuber.—**Round ; skin pale yellow, splashed pink,** sometimes whole pink ; eyes deep ; flesh white ; sprouts pink.

Foliage.—**Tall and branching** ; stem mottled red-purple ; wings waved ; **leaf close** ; midrib with only a spot of pink at base and bases of leaflet stalks ; **leaflet medium green, large, and glossy,** slightly wrinkled and arched ; terminal leaflet droops.

Flower.—**Red-purple distinctly tipped white, rather infrequent** ; anthers malformed. Buds dark, with green bases ; flower stalks rather short.

KATIE GLOVER (A. Findlay) (Immune).

Maturity.—Second Early.

Tuber.—Oval, thick; skin pale yellow, coloured red in the eyes and about the eyes, colour very occasionally absent; eyes shallow, but deep in large tubers; eyebrows distinct; flesh white; sprouts pink.

Foliage.—Haulm low to medium height, **spreading and bushy, with a regular circular compact appearance**; stems branching and numerous, with finely waved wings, developing pink colour towards maturity; leaf moderately open; leaflets light to medium green, thin soft, with waved margins; veins well marked.

Flower.—Not observed; flower buds hairy and pink, but often yellowish before dropping off, **very numerous, in a cluster,** the cluster of buds not occurring on every plant; stalk long, leafy, and pink tinged.

Rogues.	See Page.	Distinguishing Characteristics.
Rough-leaved Rogue	92	Haulm tall; stems red-purple; leaf close, arched and rigid; leaflets dull, rounded, markedly wrinkled; tubers white.

KERR'S PINK (Henry) (Immune).

Maturity.—Late Maincrop.

Tuber.—Round (somewhat flat); pink; dented at heel; eyes usually medium, but sometimes deep; flesh white; sprouts pink.

Foliage.—Haulm tall and branching; very vigorous; stem strong, **tinged pink**; wings distinctly waved; **leaf rigid and fairly close**; midrib pink; **leaflets dull, medium to dark green, large, broad** and pointed; secondary leaflets large and often borne on leaflet stalks.

Flower.—White and freely formed; anthers pale yellow; buds dark.

Rogues and Substitutes.	See Page.	Distinguishing Characteristics.
		Pink tubers.
Rogue like Great Scot*	90	Anthers orange ; leaflets glossy ; terminal drooping.
Yam* . . .	94	Anthers orange ; buds green ; leaf open ; tuber deeper pink ; flesh yellow.
Reading Russet* .	89	Anthers orange ; low growing ; leaflet narrow ; produces berries.
Orange Anther Substistute* . .	88	Anthers orange ; leaflets with a waxy appearance.
Waverley . .	94	Tuber long oval ; leaflet glossy and especially the terminal, large.
Sharp's Pink Seedling* . . .	92	Flower red-purple ; leaflets round and distinctly pointed.
Irish Queen . .	30	Flower red-purple ; leaf glossy.
Lord Rosebery* .	85	Flower red-purple ; low growing ; tuber deeper pink.
Raeburn's Gregor Cups* . . .	89	Flower red-purple ; leaf open.
Maud Meg* . .	86	Flower red-purple ; leaf open ; flesh yellow ; tuber bright pink.
Gregor Cups . .	83	Non-flowering ; leaflets wrinkled.
		Tubers splashed pink.
Beauty of Bute* .	77	Flower red-purple ; margins of leaflets turned down.
King Edward VII. .	34	Kidney ; flower red-purple, seldom flowering ; top leaflets narrow.
		Tubers splashed purple.
Buchan Beauty* .	80	Flower dark blue-purple ; stems splashed dark blue-purple.
Fortyfold . .	83	Non-flowering ; buds green ; leaflets light to medium green ; small.

* Denotes free-flowering.

Rogues and Substitutes.	See Page.	Distinguishing Characteristics.
		White tubers.
Champion* . .	20	Flower dark blue-purple ; stems numerous, thin, purple.
Arran Chief . .	15	Buds green ; leaflets wrinkled.

* Denotes free-flowering.

Alternative Classification.

		Flower Coloured and Freely Formed.
Sharp's Pink Seedlings† . .	92	Round, distinctly pointed leaflets, earlier.
Irish Queen . .	30	Broad, glossy leaflets ; tuber splashed yellow.
Lord Rosebery .	85	Low growing ; tuber deeper pink.
Raeburn's Gregor Cups†	89	Leaf open.
Beauty of Bute .	77	Leaflets have well-marked veins and a distinct downward curve; tuber white ; splashed pink.
Maud Meg . .	86	Leaf open ; tuber oval and brighter pink ; flesh yellow.
Buchan Beauty .	80	Stems splashed deep purple ; tuber white, splashed purple.
Champion . .	20	Stems thinner, harder and more numerous ; leaflets narrow ; tuber white.
		Flower White and Freely Formed ; Anthers Orange.
Yam . . .	94	Leaf open ; buds green ; flesh yellow.
Rogue like Great Scot†	90	Leaflets dark green, glossy ; terminal drooping.
Reading Russet† .	89	Low growing ; leaflets narrow ; produces berries.

† Varieties marked thus have round pink tubers, which are not readily distinguishable from those of Kerr's Pink.

Rogues and Substitutes.	See Page.	Distinguishing Characteristics.
Orange Anther Substitute† . .	88	Leaflets waxy and have a thick appearance.
		Flower Seldom Formed.
Arran Chief . .	15	Leaflets more wrinkled; buds green; tuber white.
Fortyfold . .	83	Leaflets small, pale green; buds green; tuber purple, splashed yellow.
Waverley . .	94	Leaflets large, fleshy appearance; tuber kidney, pink.
King Edward VII. .	34	Top leaflets small, narrow and twisted forward; tuber kidney, white, splashed pink.
Gregor Cups† . .	83	Leaflets wrinkled; tuber very coarse.

† Varieties marked thus have round pink tubers, which are not readily distinguishable from those of Kerr's Pink.

KING EDWARD VII. (Butler) (Non-immune).

Maturity.—Early Maincrop.

Tuber.—Kidney (oval to pear-shaped); skin white, **more or less splashed with pink**; characteristically smooth on surface; eyes shallow; flesh white; sprouts pink.

Foliage.—Haulm erect, tall, branching, **tops crowded**; stems with a pink tinge; **leaves dark green and glossy**; **leaflets with waved margins,** the **younger leaflets on top being very small, narrow, numerous and twisted forward,** the last pair fitting round the terminal.

Flower.—Red-purple, but very seldom formed; buds pink; flower stalks short.

Red King Edward, Red Kings and Rob Roy are selections from King Edward VII., having tubers almost wholly pink.

Bolters and Wildings are of common occurrence.

Rogues.	See Page.	Distinguishing Characteristics.
		Flower coloured.
Up-to-Date* . .	50	Habit spreading; foliage dull, light green.
Beauty of Bute* .	77	Leaflets lighter green, with well-marked veins; tuber round, deep-eyed.
Blue Grey . .	78	Stems numerous, slender; leaflets light grey-green, dull, round; tuber white, round.
Blue Gloss* . .	77	Leaf short; leaflets drooping; tuber white, round.
Magnum Bonum .	86	Habit more bushy, stems with waved wings; leaflets dull green, lower leaflets thin; tuber white, long oval.
Peachbloom* . .	88	Anthers loose, leaf open, with marked pink colour at bases of leaflet stalks; tuber round.
		Flower White.
British Queen* .	18	Foliage rigid.
Abundance* . .	48	Leaf close.
		Foliage light green.
Up-to-Date Wilding	50	See Bolters and Wildings, p. 103.
Early Market . .	82	Haulm compact, spreading; foliage dull, light green; tuber white, deep-eyed, with raised eyebrows.
		Buds green.
Arran Chief . .	15	Flower greenish-white, infrequent; buds mostly green; stems dark, with waved wings; leaf rigid; leaflets wrinkled, dull; tuber white, round.
Northern Star .	44	Leaflets dark grey-green; tubers round.

* Denotes free-flowering.

Rogues.	See Page.	Distinguishing Characteristics.
		Various.
Royal Kidney .	46	Stems without colour; top foliage dull and drooping; secondary leaflets upward pointed; tuber white, long oval.
Evergood . .	27	Stems without colour; foliage tops drooping; leaflets thick, waxy; tuber white, oval, flat.
Lymm Gray . .	85	Habit spreading; leaflets dull, grey-green, soft; tuber round, heel faint pink.
Rocks . . .	89	Stems spindly; leaf rigid, upright; leaflets wrinkled, small, round; tuber round, deep-eyed.
Rogue like Evergood Bolter . .	90	Leaf short, open; leaflets dull, hairy; flower buds hairy, numerous, generally with long tips; tuber white.

KING GEORGE V. (Butler) (Immune).

Maturity.—Second Early.

Tuber.—Oval to oval pointed; skin white, occasionally with a touch of pink at the heel and at the rose end; eyes medium on point of tuber, **those on side of tuber with raised eyebrows**; flesh white; sprouts pink.

Foliage.—Haulm of medium height, with a **drooping appearance**; **spreading.** Stems branching, tinged red-purple; stem tops with slightly waved wings. **Leaf open and drooping**; leaflet medium green, **soft** and dull.

Flower.—White, with anthers sometimes malformed and pale, **occurring fairly freely**; flower stalks long and bronze coloured; buds dark.

Rogues.	See Page.	Distinguishing Characteristics.
		Flower coloured.
Myatt's Ashleaf Rogue.	91	Berries frequent ; tubers round.
Bravo* . .	79	Stems numerous and thin ; tubers small round.
		Foliage light green.
Bravo* . .	79	See above.
Eclipse . . .	24	Haulm lower ; leaflets light green, small and round ; stem solid.
Early Market . .	82	Non-flowering ; haulm compact ; leaflets light green, small, round and wrinkled.
		Various.
British Queen* .	18	Foliage rigid ; more compact, generally brighter.
Abundance* . .	48	Haulm taller, leaf closer, more rigid ; tuber with faint blue-purple heel.
King Edward VII. .	34	Haulm tall, upright ; top leaves with dark green, bright, narrow leaflets, which are twisted forward ; tuber with pink splashing.
Arran Chief . .	15	Tall, upright ; wing waved ; leaf rigid ; leaflet wrinkled ; tuber round ; late.

* Denotes free-flowering.

LANGWORTHY (Niven) (Immune).

Maturity.—Late Maincrop.

Tuber.—Kidney (pear-shaped) ; skin white ; eyes shallow, saucer-shaped, **with raised eyebrows** ; flesh white to lemon colour ; sprouts blue ; scale leaves sometimes blue.

Foliage.—Tall, vigorous, very upright, consisting of a few stout stems, tinged blue-purple near the base ; leaflets **medium green and markedly wrinkled.**

Flower.—Purple, distinctly white-tipped and freely formed ; bases of the flower buds green.

Golden Wonder (Brown) resembles Langworthy, except that the tuber has a russet skin. Langworthy is the old "Maincrop" (Clark).

"What's Wanted" is identical with Langworthy.

Wildings occur.

Rogues.	See Page.	Distinguishing Characteristics.
		Flower white.
British Queen*	18	—
Abundance*	48	—
Templar*	74	Leaflets dull ashy green, smooth, small ; buds dark.
		Various.
Up-to-Date*	50	Flower not white-tipped ; foliage less wrinkled, lighter in colour ; leaflets larger, terminal leaflet overlapped.
President*	44	Foliage lighter green ; leaf with 5 large oblong leaflets ; tuber round.
Magnum Bonum	86	Leaflet stalks with red mark at base ; leaflets lighter green, thinner-looking.
Peachbloom*	88	Flower large with loose anthers ; stem branches thin, numerous, tinged red-purple ; wings waved ; leaf open, with red markings on midrib ; tubers round, splashed red.
Myatt's Ashleaf Rogue*	91	Flower dark blue-purple, with large tips of white ; berries profuse ; haulm less tall, spreading ; stems numerous ; wings waved ; leaf open and rigid ; leaflets small, dull, with waved margins.
Blue Gloss*	77	Flower blue-purple ; stems thin ; leaflets glossy, drooping ; tubers round.

* Denotes free-flowering.

Rogues.	See Page.	Distinguishing Characteristics.
Blue Grey . .	78	Flower pale blue ; stems thin ; leaf open ; leaflets grey-green.
Eclipse . . .	24	Low growing ; leaflets dull light green, small and round ; stems solid ; early.
King Edward VII. .	34	Young leaflets small, narrow, dark green, glossy, twisted forwards ; tuber kidney, splashed pink.
Arran Chief . .	15	Flower greenish-white, infrequent ; flower buds green ; foliage rigid and branching ; tuber round.
Rocks . . .	89	Branches numerous, thin, green ; leaf open, rigid, upright ; leaflets small ; tubers round, with deep eyes.
Wilding . .		See Bolters and Wildings, p. 103.

LOCHAR (W. R. Farish) (Immune).

Maturity.—Late Maincrop.

Tuber.—Round, sometimes with pink dots under the skin ; skin white, very delicately pink when immature, with more pink in the eyes and the heel ; eyes medium deep, saucer-shaped ; flesh white ; sprouts pink.

Foliage.—Haulm of medium height to tall and compact ; stem branching freely above ground. **Leaf rigid, with a distinct crowded appearance** ; leaflets **small, rounded and dull, with a delicate shade of green,** tending to be cupped, exposing the margin of the underside ; **secondary leaflets numerous** and **raised above the level of the larger leaflets.**

Flower.—White, generally not freely formed ; buds green.

Rogues.	See Page.	Distinguishing Characteristics.
		Flower coloured.
Up-to-Date* . .	50	—
Bobbie Burns* .	79	—
		Buds dark.
British Queen* .	18	Habit lower set ; leaf open.
Abundance* . .	48	Leaf dark green, glossy.
Summit* . .	93	Habit open ; leaf open, short and rigid.
King Edward VII. .	34	Foliage tops with small, narrow, bright leaflets twisted forward ; tuber kidney (pear shaped), splashed pink.
Up-to-Date* . .	50	See above.
Bobbie Burns* .	79	See above.
		Secondaries not above level of leaflet.
Arran Chief . .	15	Foliage wrinkled ; stem wings waved ; tuber with purple heel.
Northern Star .	44	Foliage darker ; leaf more open ; leaflets narrower, dark greyish green.
Up-to-Date* . .	50	See above.
British Queen* .	18	See above.
Summit* . .	93	See above.

* Denotes free-flowering.

MAJESTIC (A. Findlay) (Immune).

Maturity.—Early Maincrop.

Tuber.—Kidney (pear-shaped to long oval) ; skin white ; eyes shallow ; flesh white ; sprouts faint pink ; second growth takes the form of cracking.

Foliage.—Haulm of medium height, spreading ; less rigid than that of British Queen. Leaf and leaflets flat, open and smooth, **ashy green** ; midribs of young leaves with a pink tinge ; leaflets pointed.

Flower.—Creamy white, profuse. Berries occur freely. Buds pink.

Rogues.	See Page.	Distinguishing Characteristics.
		Flower coloured.
Up-to-Date* . .	50	Flower red-purple, tipped a lighter shade.
Bravo* . .	79	Flower pale blue, tipped white ; buds green ; stems thin, numerous ; tubers round, small.
		Seldom flowering or non-flowering.
K. of K. . .	84	Taller ; stems numerous ; wings waved ; foliage light green ; tuber red about the eyes.
Early Market . .	82	Haulm compact ; leaflets round, light green, wrinkled.
Eclipse . . .	24	Low growing ; stems pink and solid ; leaflets small, dull, round ; 1st early.
Magnificent . .	85	Foliage darker, dull, hairy, wrinkled ; leaflets larger.
Evergood . .	27	Haulm taller ; foliage dark ; tops drooping.
King Edward VII .	34	Taller ; foliage tops dark, glossy, crowded ; tuber splashed pink.
Northern Star .	44	Buds green ; habit tall ; leaf short and rigid ; leaflets small and pointed.
Arran Chief . .	15	Buds pale green ; taller ; stem wing waved ; leaflets duller, wrinkled.
Rough-leaved Rogue	92	Haulm bushy, leaf close, rigid ; leaflets dull, rounded, wrinkled.
		Various.
British Queen* .	18	Habit more rigid ; foliage darker, more glossy ; tubers oval, pointed.
Abundance* . .	48	Taller ; leaf closer, darker, more glossy ; leaflet broader ; tuber oval, with purple heel.

* Denotes free-flowering.

Rogues.	See Page.	Distinguishing Characteristics.
King George V.*	36	Anthers lemon-coloured; leaf darker and more drooping; leaflet broader; tubers oval, pointed.
Templar*	74	Taller; stems mottled purple; leaf rigid.
Colourless Rogue*	81	Buds dark green; taller; stems numerous; leaflets darker; wrinkled and dull.

* Denotes free-flowering.

MAY QUEEN (Sadler) (Non-immune).

Maturity.—First Early.

Tuber.—Kidney; skin white; eyes shallow; flesh white and soft; sprouts blue; scale leaves sometimes faint blue.

Foliage.—Haulm of low to medium height, spreading, vigorous; stem slightly tinged purple, with **waved wings**; leaflet **large,** dark to medium green, glossy, cupped, **with waved margins,** the last pair of leaflets fitting round the terminal.

Flower.—Light blue-purple, with large tips of white occurring frequently; flower parts irregular; flower stalks long; buds purple.

Rogues.	See Page.	Distinguishing Characteristics.
		Flower pale blue.
Myatt's Ashleaf*	69	More upright; leaf rigid; leaflets small and mottled; flesh yellow.
Sharpe's Victor*	74	Leaflets round; flesh yellow.
		Flower white.
British Queen*	18	—
Puritan	45	Leaflets lighter green; buds greener.
		Non-flowering.
Sharpe's Express	47	Leaf markedly crowded.
Royal Kidney	46	Haulm tall, with drooping tops.

* Denotes free-flowering.

Rogues.	See Page.	Distinguishing Characteristics.
Duke of York . .	23	Haulm open ; foliage dull, of thick appearance ; flesh yellow.
Ninetyfold . .	43	Wings straight ; leaflets slightly wrinkled. Aucuba spotting common.
Rogue like May Queen	91	Broad straight wings ; tubers oval ; buds clustered.

NINETYFOLD (Clark) (Non-immune).

Maturity.—First Early.

Tuber.—Oval, pointed ; skin white ; eyes on point shallow, eyes on side often with raised eyebrows ; flesh white and soft ; sprouts pink.

Foliage.—Haulm of medium height, **spreading.** Stem slightly tinged pink towards maturity ; leaflets medium green ; last pair overlap the terminal.

Yellow Aucuba spotting in leaves very common.

Flower.—White (rarely formed), anthers generally pale yellow and malformed ; sepals long, with green tips.

Rogues.	See Page.	Distinguishing Characteristics.
		Flower white.
British Queen* .	18	Foliage rigid ; leaflet broader.
Fiftyfold* . .	83	Leaf close ; leaflets round and dull ; berries frequent.
Puritan . . .	45	Leaf semi-rigid and open.
		Flower coloured.
May Queen* . .	42	Leaflets darker, with waved margins.
		Various.
Eclipse . . .	24	Leaflets dull light green and round ; stems solid.
Epicure . . .	26	Haulm upright, with drooping tops ; leaflets dark, glossy and narrow.
Early Market . .	82	Foliage light green and dull ; wings waved ; early maincrop.

* Denotes free-flowering.

NORTHERN STAR (A. Findlay) (Non-immune).

Maturity.—Late Maincrop.

Tuber.—Round; skin white, **with a small spot of pink in the eyes** and the heel, especially during the growing season; eyes medium; flesh white; sprouts pink; second growth runners common.

Foliage.—Haulm **tall,** upright and **compact**; stems branching freely, wings slightly waved; stems slightly tinged pink towards maturity; leaf **fairly open and rigid,** midrib tinged red-purple in younger leaves; **leaflets small, pointed, with a dark grey-green appearance.**

Flower.—Small, white, with green tips, seldom formed; anthers pale yellow and malformed; **flower buds markedly green.**

Allies (not Ally), Aeroplanes, and Ajax are identical with Northern Star.

PRESIDENT (Non-immune).

Maturity.—Late Maincrop.

Tuber.—Round (flat); skin white; eyes medium; saucer shaped; flesh white; sprouts pink.

Foliage.—Habit tall, upright, vigorous; stems branching, slightly tinged pink, wings waved; **leaf markedly open and rigid, characteristically composed of five large and two small leaflets; leaflets large, broad, dull light to medium green,** slightly wrinkled.

Flower.—Red-purple, distinctly tipped white; freely formed and with a long period of bloom, usually continuing well into October; flower stalks long, buds dark; **berries freely occurring.**

General is identical with President, except that the colour of the flower is white.

Rogues.	See Page.	Distinguishing Characteristics.
Up-to-Date* . .	50	Flower not white-tipped; habit spreading, less rigid; terminal leaflet overlapped by next pair.

* Denotes free-flowering.

Rogues.	See Page.	Distinguishing Characteristics.
Champion* . .	20	Flower dark blue-purple ; stems thin, numerous, purple ; leaflets narrow.
Blue President Rogue*	78	Flower dark blue-purple ; stems mottled dark purple ; leaf with a soft appearance.
Arran Chief . .	15	Flower infrequent ; buds green ; leaf darker.

* Denotes free-flowering.

PURITAN (Non-immune).

Puritan is identical with the old American variety White Beauty of Hebron. The original Beauty of Hebron has pink tubers.

Maturity.—First Early.

Tuber.—Oval, pointed ; skin white ; eyes medium, **eyebrows long and raised** ; flesh snow-white and soft ; sprouts faint pink.

Foliage.—Haulm of medium height, spreading ; stem slightly tinged pink towards maturity ; leaf semi rigid ; leaflet medium green and glossy ; **secondary leaflets very small.** The last pair of leaflets overlap the terminal.

Flower.—White, fairly frequent ; anthers orange ; buds green or dark, with green tips. Sepals long.

Rogues.	See Page.	Distinguishing Characteristics.
British Queen* .	18	Foliage more rigid ; second early.
Epicure . . .	26	Upright, with drooping tops ; leaflets narrow and glossy.
Ninetyfold . .	43	Non-flowering ; Aucuba spotting common.
Maybole Rogue .	87	Flower light red-purple, tipped white ; low growing ; leaflets markedly large, cupped glossy and thin, with waved margins.

* Denotes free-flowering.

RHODERICK DHU (S. T. Farish) (Immune).

Maturity.—Late Maincrop.

Tuber.—Round (somewhat flat); dented at heel; eyes medium, on the shoulder, close together; skin white; flesh white; sprouts pink.

Foliage.—Haulm very tall, stout, upright, branching, and very vigorous; wings slightly waved; leaves large, **close and rigid**; **leaflets dull, medium green and hairy.** Leaf very crowded, with **large secondary leaflets,** the pair of **secondary leaflets at the base of the last pair of leaflets** being very conspicuous.

Flower.—Fairly small, white with green tips, occurring **fairly freely.** Anthers generally pale green and malformed; buds pink.

Rogues.	See Page.	Distinguishing Characteristics.
		Flower coloured.
Up-to-Date* . .	50	—
Tinwald Perfection .	49	Leaflets glossy, slightly wrinkled.
Bobbie Burns* .	79	Leaf open.
		Buds green.
Lochar . . .	39	Leaflets small, rounded, cupped, and of a delicate shade of green.
Arran Chief . .	15	Flower infrequent; leaflets wrinkled; secondary leaflets smaller; tubers with a blue dot at heel.
		Various.
Epicure . . .	26	Stems pink; foliage brighter and drooping; leaflets narrow; early.
British Queen* .	18	Habit low set; leaf open, rigid, glossy; second early.

* Denotes free-flowering.

ROYAL KIDNEY (A. Findlay) (QUEEN MARY) (Non-immune).

Maturity.—Second Early.

Tuber.—Kidney (long oval); skin white; eyes shallow, on the point; flesh white; sprouts pink.

Foliage.—Haulm of medium height to tall, **upright**: **midribs of leaves at young stage with a tinge of pink at the base, and at the bases of leaflet stalks**; leaflet medium to dark green; **top foliage dull and drooping.** Secondary leaflets not numerous, **projecting upwards.**

Flower.—**Absent,** stalks short; buds green at base, dropping readily.

SHARPE'S EXPRESS (Non-immune).

Maturity.—First Early.

Tuber.—**Kidney (pear-shaped)**: skin white; eyes on the point small and saucer-shaped, those on the sides having raised eyebrows; flesh white; sprouts pink.

Foliage.—Haulm upright to spreading; leaves long, medium green and bright, **with a large number of bright secondary leaflets which give the leaf a crowded appearance**; leaflets distinctly pointed forward and overlapping. The last pair of leaflets often twist round the end leaflet, which curls up to fit into them.

Flower.—**Red-purple, infrequent**; buds with pink markings. Bolters occur.

Rogues.	See Page.	Distinguishing Characteristics.
		Flower coloured.
Myatt's Ashleaf* .	69	Pale blue-purple, tipped white; berries profuse; buds dark and profuse; stems purple; leaf open; leaflets smaller and often with a mosaic appearance.
May Queen* . .	42	Wings of stem waved; leaflets with wavy margins and darker; secondary leaflets inconspicuous.
Blue Gloss* . .	77	Small; haulm taller; stems numerous, thin, mottled blue-purple; leaf short; leaflets drooping; tuber round, small.

* Denotes free-flowering.

Rogues.	See Page.	Distinguishing Characteristics.
		Various.
British Queen*	18	Flower white.
Eclipse	24	Leaflets small, dull, light green, rounded ; stem solid.
Dargill Early	22	Leaf more open.
Royal Kidney	46	Haulm taller, with drooping tops ; leaf open and darker, with touches of pink in the midrib ; later maturity.
Duke of York	23	Leaf open ; leaflets thick, dull. Tubers with yellow flesh.

* Denotes free-flowering.

SUTTON'S ABUNDANCE (Clark) (Immune).

Maturity.—Early Maincrop.

Tuber.—Oval to round, flat ; eyes shallow, open and usually on the shoulder ; **eyebrows long and distinct** ; flesh white. During the growing season **the heel end usually shows a blue-purple coloration.** The runners have usually at least a trace of blue-purple, and the second growth runners have always a blue-purple tint. Sprouts blue.

Foliage.—Haulm tall, strong, and upright ; stem branching and becoming blue-purple tinted ; **leaf close** ; **leaflets dark green, glossy and overlapping, the secondary leaflets numerous, round, and well developed,** giving the leaf its close appearance.

Flower.—White and numerous ; berries occurring occasionally. The buds are dark and the style is long.

N.B.—There are numerous so-called varieties of the Abundance type. Some of the commoner are Jeanie Deans, Kerr's New White, Culdees Castle, Crofter, Crowner, Provost, Osborne Seedling, Dobbie's Favourite, Twentieth Century, Secundus, Laing's Prolific, Admiral, Bloomfield, Balmuir, White Rose, Plotholder, Darlington, Lomond, and Just in Time.

Rogues.	See Page.	Distinguishing Characteristics.
		Flower coloured.
Up-to-Date*	50	Foliage lighter green ; late.
President*	44	Foliage lighter green ; late.
Magnum Bonum	86	Leaf open ; midrib with pink spots ; leaflets dull, generally mosaiced ; lower leaflets with a thin appearance.
		Seldom flowering or non-flowering.
Early Market	82	Haulm less tall, foliage dull light green.
Arran Chief	15	Buds green ; stem wing waved ; leaf rigid and more open ; leaflet dull and wrinkled ; late.
King Edward VII.	34	Upper leaflets small, narrow and twisted forward ; tuber white splashed pink.
		Various.
British Queen*	18	Haulm less tall ; leaf rigid and open.

* Denotes free-flowering.

TINWALD PERFECTION (W. R. Farish) (Immune).

Maturity.—Early Maincrop.

Tuber.—Oval ; skin white ; eyes shallow ; sprouts faint pink.

Foliage.—Haulm spreading, more compact than that of Up-to-Date, which it resembles ; leaves drooping ; leaflets round, glossy, **arched,** and slightly wrinkled.

Flower.—Red-purple, generally tipped white, fading very quickly, blooming only moderately freely and for a short period ; branches of the flower stalk short and thin ; buds pink.

Rogues.	See Page.	Distinguishing Characteristics.
Up-to-Date*	50	Flower tips not white ; flowering persistently ; foliage dull, flower stalks stronger, not arched ; late.
Langworthy*	37	Haulm tall and upright ; leaflets wrinkled ; tuber kidney (pear-shaped).
Bobbie Burns*	79	Haulm taller, more open ; stem wing broad ; leaf duller, more rigid, more open ; leaflets narrower and more pointed ; tuber round.
British Queen*	18	Flower white.
Early Market	82	Non-flowering ; foliage dull, light green, rigid.
Arran Chief	15	Flower white, with green tips, infrequent ; buds green ; haulm tall ; stem wings waved ; foliage dull and rigid.
Northern Star	44	Non-flowering ; buds green ; haulm tall ; foliage dull and rigid ; leaflets small, pointed, dull and thick.
King Edward VII.	34	Haulm tall ; upper leaflets small, narrow, twisted forward ; tuber white, splashed pink.
Templar*	74	Flower white ; stem dark ; leaflet ashy green, smooth.

* Denotes free-flowering.

UP-TO-DATE (A. Findlay) (Non-immune).

Maturity.—Late Maincrop.

Tuber.—Oval ; skin white ; eyes shallow and on the point of the tuber ; flesh white ; sprouts faint pink.

Foliage.—Haulm spreading, of medium height to tall ; **stems branching,** tinged pink towards maturity ; **leaf long, spreading, lower leaves conspicuous,** midrib of younger leaves

pink tinged at its base and at the bases of the leaflet stalks; **leaflet light to medium green, large** and dull, **end pair markedly overlap the terminal.**

Flower.—Light red-purple, gradually lightening in shade towards the tip, but not distinctly white-tipped; **blooms freely and for a long period**; flower stalks fairly long and thick; buds dark.

There are many so-called varieties of the Up-to-Date type. Some of these are:—Dalhousie, Drumwhindle, Dalmeny Beauty, Dobbie's Prolific, Factor, Glamis Beauty and Scottish Triumph.

Note.—Field-Marshal is identical with Up-to-Date, except that the tubers have a russet skin.

Wildings occur frequently.

Rogues.	See Page.	Distinguishing Characteristics.
		Flower distinctly white-tipped.
Champion*	20	Stems numerous and purple; leaf open; leaflets small, narrow.
President*	44	Haulm upright; leaf open, rigid; leaflets large, broad, few in number.
Langworthy*	37	Habit upright, stems tall; leaf wrinkled, closer and darker.
Orkney Rogue*	88	Berries profuse; leaflets darker and smaller, with waved margins.
Bobbie Burns*	79	Habit more open, leaf open; leaflets narrow, secondary leaflets small and rather numerous.
		Flower white.
British Queen*	18	—
Abundance*	48	—
		Seldom flowering or non-flowering.
Early Market	82	Leaflets light green, small, round, wrinkled, hairy.

* Denotes free-flowering.

Rogues.	See Page.	Distinguishing Characteristics.
Arran Chief . .	15	Haulm upright; stems dark, with waved wings; leaflets dark green, wrinkled; flower buds mostly green.
King Edward VII. .	34	Tops flat, with leaflets which are small, narrow, glossy, dark green and twisted forward.
Rocks . . .	89	Branches numerous, thin, green; leaf rigid, upright; leaflets dark green, small, markedly wrinkled.
		Various.
Magnum Bonum .	86	Stems spindly; leaf open, with coloured markings on midrib; leaflets small, lower leaflets of thin appearance. Mosaic disease very common.
Date Rogue like Champion* . .	82	Berries profuse; stems numerous, tall and purple; margins of leaflets waved.

* Denotes free-flowering.

WITCHHILL (Brown) SNOWDROP (Perkins) (Immune).

Maturity.—First Early.

Tuber.—Kidney (long oval), flat; skin white and smooth; **eyes very shallow and on the point**; **flesh white**; sprouts faint pink.

Foliage.—Haulm of medium height, spreading and compact, leaflets slightly arched over the midrib of the leaf; leaflets long, medium green, having a characteristic **glossy, thin,** and slightly wrinkled appearance. Towards maturity the margins of leaflets tend to curl upwards. Second growth is common, giving the haulm a taller appearance.

Flower.—Creamy white and seldom formed. Buds dark, with green tips. Sepals long.
Bolters occur frequently.

Rogues.	See Page.	Distinguishing Characteristics.
Up-to-Date* . .	50	Flower red-purple, tipped a lighter shade ; late.
British Queen* .	18	Foliage rigid ; tuber eyes deeper ; second early.
King George V.* .	36	Tuber eyes deeper ; second early.
Duke of York . .	23	Straggling habit ; leaflets thick and dull ; flesh yellow.
Evergood . .	27	Non-flowering ; haulm with drooping tops ; leaflets waxy and dark ; early maincrop.
Royal Kidney .	46	Haulm taller, with drooping tops ; midribs of leaves with pink tinge ; second early.
Sharpe's Express .	47	Bright crowded leaf.

* Denotes free-flowering.

III.—VARIETIES NEW, UNCOMMON OR SELDOM GROWN.

ABERDONIAN (Gavin) (Immune).

Maturity.—Early Maincrop.

Tuber.—Oval ; skin white ; eyes deep ; eyebrows raised ; **flesh yellow** ; sprouts pink.

Foliage.—Haulm of medium height, **spreading, bushy** ; stems **numerous,** branching freely, branches **spindly** ; wings slightly waved ; leaf **rigid, small,** midrib red-coloured at bases of leaflet stalks ; leaflets medium to dark green, **small, dull, slightly wrinkled,** margins waved.

Flower.—Red-purple, with large tips of white ; buds dark, with green bases ; stalks generally short.

ADIRONDACK (Immune).

Maturity.—Second Early.
Tuber.—Round ; **skin red** ; eyes shallow ; flesh white ; sprouts pink.
Foliage.—Haulm medium height, upright, open ; stem branching, pink ; wings waved at tops ; **leaf open, rigid — midrib markedly blood red at the base** and **at the bases of the leaflet stalks** ; leaflets medium green, glossy, **wrinkled** ; young leaflets cupped.
Flower.—Red-purple, with white tips streaked red-purple ; anthers malformed ; buds pink, with green base.

AMERICA (Dobbie) (Immune).

This variety is identical with the old American variety Irish Cobbler.
Maturity.—First Early.
Tuber.—Round ; dented at stem end ; skin white ; eyes deep ; flesh white ; sprouts pink.
Foliage.—Haulm of medium height, spreading : **leaflets large,** medium green and **round.**
Flower.—Red-purple, with white tips, occasionally occurring fairly freely.

ARDNEIL ROSE (Adams) (Immune).

This variety is identical with the American variety Early Manistee.
Maturity.—Early Maincrop.
Tuber.—Oval ; skin pink ; eyes medium, eyebrows long ; flesh white ; sprouts pink.
Foliage.—Haulm of medium height, **spreading** : stem branching, mottled purple, wings waved ; leaf open, midrib coloured in younger leaflets and at the base, and at the bases of the leaflet stalks in older leaves ; leaflet **medium green, dull.**
Flower.—White ; anthers pale yellow and malformed ; buds pink.

ARRAN ROSE (Mackelvie) (Immune).

Maturity.—First Early.

Tuber.—**Oval**: **skin rose-coloured**; eyes shallow; flesh white; sprouts pink.

Foliage.—Haulm of medium height, semi-upright and sprawling later; stems tinged pink; leaflets medium green, **distinctly wrinkled**; midribs of leaves only faintly coloured.

Flower.—White, formed moderately freely. Buds dark, with green tips.

AVONDALE (Main) (Immune).

Maturity.—Early Maincrop.

Tuber.—Kidney (long oval); skin white; eyes shallow, few; flesh white; sprouts blue.

Foliage.—Haulm of medium height to tall, upright; stem branching, mottled purple, **branches thin**; wings finely waved; leaf fairly close, **rigid**; leaflets medium green, **dull, wrinkled**; margins of young leaflets pink; secondaries conspicuous, overlapping leaflet stalks.

Flower.—Purple, with small tips of white; buds pink; stalks short.

BALCARRES (Immune).

Maturity.—Second Early.

Tuber.—Round (flat), slightly dented at heel; skin white; eyes medium, ridged; eyebrows raised; flesh white; sprouts pink.

Foliage.—Haulm of medium height, upright; stem wings broad; leaf **open**, drooping; leaflets **rounded, dark green** and slightly wrinkled; secondary leaflets fairly numerous and prominent, sometimes borne on leaflet stalks.

Flower.—White; buds dark, with green tips; stalks long.

BALVAIRD (M'Naughton) (Immune).

Maturity.—Second Early.
Tuber.—Oval, pointed ; skin white ; eyes shallow to medium ; flesh white ; sprouts pale pink.
Foliage.—Haulm of medium height, upright, sprawling later ; stem branching ; leaf open and rigid ; leaflets broad, medium green, dull ; last pair of leaflets point forward.
Flower.—Absent ; stalks short ; buds dropping.

BARLEY BOUNTY (Salaman) (Immune).

Maturity.—Early Maincrop.
Tuber.—Kidney (long oval) ; skin white ; eyes shallow, on point ; flesh white ; sprouts pink.
Foliage.—Medium height, spreading ; **stems numerous,** tinged red-purple, especially at base ; **wings waved** and sometimes double ; **leaf open,** rigid ; leaflet **light green, dull, hairy, wrinkled** (probably as a result of severe mosaic infection) ; secondaries numerous.
Flower.—Red-purple, with white tips ; buds red-purple.

BENALT (Guthrie) (Immune).

Maturity.—Early Maincrop.
Tuber.—Round (flat), dented at heel ; skin white, with traces of **pink** in the eyes ; **eyes** medium, ridged ; flesh **pale yellow** ; sprouts pink.
Foliage.—Haulm of medium height to tall, upright, spreading later ; stems thin ; wings of main stems broad, but waved at tops ; leaf open and rigid ; leaflets medium green, **glossy, cupped.**
Flower.—Absent ; buds green, with long tips, dropping off readily.

BEN CRUACHAN (Paton) (Immune).

Maturity.—Late Maincrop.
Tuber.—Oval ; skin white ; eyes shallow ; flesh white ; sprouts blue ; runners profuse, purple.

Foliage.—Haulm **tall, upright** : stem branching **very freely,** mottled red-purple ; leaf fairly open, midrib red-purple at base and bases of leaflet stalks in young stages ; leaflets medium to dark green, **dull,** slightly wrinkled, cupped, **pointed,** often with waved edges, particularly in lower leaves, tips having a characteristic twist ; secondary leaflets numerous, with waved edges, often on leaflet stalks.
Flower.—**Blue-purple, tipped white** ; **buds dark.**

BEN LOMOND (Paton) (Immune).

Maturity.—**Second Early.**
Tuber.—**Oval ;** skin white ; eyes shallow ; flesh white ; sprouts blue.
Foliage.—Haulm of medium height, **compact,** spreading ; stem blue-purple at base and above nodes ; leaf fairly close ; leaflets large, slightly wrinkled, **arched,** medium green, with heart-shaped bases ; terminal leaflet drooping.
Flower.—**White** ; **frequent** ; buds dark.

CARDINAL (A. Reid) (Immune).

Maturity.—**Second Early.**
Tuber.—**Kidney** (pear-shaped) ; **skin deep red** ; eyes shallow ; flesh white, **streaked red** ; sprouts pink.
Foliage.—Haulm low to medium height, spreading, sprawling later ; stem dark red-purple, especially at the base ; **leaf markedly open, midrib red-purple** ; leaflets small, dull medium green ; secondary leaflets round, **terminal leaflet droops.**
Flower.—**Red-purple, with white tips** ; berries occur ; buds red-purple ; stalks long, tinged red-purple.

CELT (A. Findlay) (Immune).

Maturity.—**Late Maincrop.**
Tuber.—**Oval** to round ; skin white ; eyes on point, medium to deep, with raised eyebrows ; flesh white ; sprouts pink.

Foliage.—Haulm of medium height to tall, **vigorous, spreading, and compact** ; and **branching excessively** ; stems tinged red, purple ; **wings markedly waved** ; leaf long, open, and rigid ; leaflets long, medium green, and with waved margins.
Flower. –**Purple, tipped white,** large, profuse ; anthers often pale yellow and twisted ; buds dark, hairy and **often in a cluster.**

CELURCA (Reid) (Immune).

Maturity.—Late Maincrop.
Tuber.—Oval ; skin white ; eyes shallow to medium ; flesh white ; sprouts pink.
Foliage.—Haulm of medium height, upright ; stem branching very freely, slightly mottled red-purple ; wings waved ; leaf rigid and open ; leaflet medium green and dull ; stalks long.
Flower.—White, infrequent ; stalks short ; buds green.

CHAMPION II (Robertson) (Immune).

Maturity.—Late Maincrop.
Tuber. –**Round** ; skin white ; eyes large and deep, ending in a point ; sprouts pink.
Foliage.—Haulm medium height to tall, spreading, stem branching ; **leaf open,** a touch of purple in midrib of younger leaf ; leaflet **dull grey-green, hairy.**
Flower.—Creamy white, medium size, **profuse** ; anthers deep orange ; stalks long and strong ; berries frequent ; buds dull red-purple.

CLAYMORE (M'Innes) (Immune).

Maturity.—Late Maincrop.
Tuber.—Round ; skin white ; eyes shallow, close together ; flesh white ; sprouts pink.
Foliage.—Haulm **tall, upright, dense,** vigorous ; stem wings waved ; leaf **open** ; leaflets medium green, **broad.**
Flower.—White, profuse ; buds **green.**

CORONA (Reid) (Immune).

Maturity.—Late Maincrop.
Tuber.—Round ; skin white ; eyes shallow, rounded ; flesh white ; sprouts pink.
Foliage.—Haulm **tall, upright,** spreading later ; stems mottled purple, especially near the base ; wings slightly waved ; leaf **close** ; leaflets medium to dark green, slightly **wrinkled, arched** ; secondary leaflets **large, cupped.**
Flower.—Absent ; **buds green.**

CORONATION (Gardiner) (Immune).

Maturity.—First Early.
Tuber.—Round ; skin white ; eyes shallow and on point of tuber, saucer-shaped ; flesh white ; sprouts pink. Towards maturity there is often a pink spot on the stem end of tuber.
Foliage.—Haulm low to medium height, spreading ; leaf open ; leaflets medium green, glossy ; **drooping,** and **slightly wrinkled.**
Flower.—Absent.

CRIMSON BEAUTY (Immune).

Maturity.—Second Early.
Tuber.—Oval ; skin **deep pink** ; eyes very shallow ; flesh white, tinged pink ; sprouts pink.
Foliage.—Haulm of **low to medium height, spreading** ; stem slightly mottled red-purple ; leaf **markedly open, drooping,** midrib red in younger leaves ; leaflets **medium to dark green, small.**
Flower.—Absent.

DEAN (Wilson) (Immune).

Maturity.—Late Maincrop—very late in maturing.
Tuber.—Oval (flat) ; skin white, with traces of blue-purple colour about the eyes at lifting time, and turning light purple on exposure ; eyes medium to shallow, saucer-shaped ; flesh white ; sprouts blue.

Foliage.—Habit tall, branching and strong ; stems mottled purple ; wings slightly waved, becoming almost black at the end of September. **Leaf open** ; midrib red-purple at base and bases of leaflet stalks ; **leaflet narrow, soft, dull, light green** ; tops of haulm sulphury.

Flower.—Small, white, generally with a light blue tinge, tipped creamy white ; stalks short ; buds dark, small and numerous. The backs of the petals generally have a light blue tint. The flowers do not open out until late in the season, but are sometimes frequent.

DOMINION (Poad) (Immune).

Maturity.—Late Maincrop.

Tuber.—Oval ; skin white ; eyes shallow ; flesh white ; sprouts blue.

Foliage.—Haulm tall, upright ; stems blue-purple, branching ; wings waved at tops ; **leaf close** ; leaflets medium to dark green, **glossy, markedly wrinkled, drooping ;** secondaries well developed.

Flower.—White, infrequent ; buds dark, sometimes clustered ; **stalks bear small leaflets.**

DUKE OF PERTH (Young) (Immune).

Maturity.—Late Maincrop.

Tuber.—Oval, thick ; skin white ; eyes shallow ; eyebrows long ; flesh white ; sprouts blue.

Foliage.—Haulm **tall,** upright, **dense,** vigorous ; stems strong ; branching freely below ground ; mottled dark red-purple ; wings waved at the tops ; leaf fairly open and short ; leaflets light to medium green, **dull and soft.**

Flower.—Absent ; buds pink ; dropping.

DUMFRIES FAVOURITE (Sutton & Son) (Immune).

Maturity.—Late Maincrop.

Tuber.—Round ; skin white ; eyes shallow, ridged ; flesh white.

Foliage.—Haulm of medium height to tall, spreading ; stem wings slightly waved ; leaf **rigid, open** ; leaflet medium green, **soft.**

Flower.—**Red-purple, with small tips of white** ; anthers pale, malformed ; buds greenish to medium dark.

DUNAVERNEY (Immune).

Maturity.—Late Maincrop.

Tuber.—**Oval** ; skin white ; eyes shallow to medium ; flesh white ; sprouts blue.

Foliage.—**Haulm tall,** upright ; stems slightly mottled purple, **branching freely** ; wings broad, slightly waved ; **leaf rigid and open** ; **leaflet broad, dark green and glossy** ; stalks long.

Flower.—**White, large and profuse** ; stalks long ; buds dark.

DUNDARAVE (Macnaughton) (Immune).

Maturity.—Early Maincrop.

Tuber.—**Kidney (long oval)** ; skin white ; eyes shallow to medium, ridged on the point ; flesh **pale yellow** ; sprouts pink.

Foliage.—Haulm of medium height to tall, upright, **open** ; stem **branching freely** ; **leaf open, rigid** ; leaflets medium green ; secondary leaflets fairly numerous.

Flower.—**White, large, profuse** ; backs sometimes streaked purple ; buds pink.

DUNNOTTAR CASTLE (Paton) (Non-immune).

Maturity.—First Early.

Tuber.—**Oval** ; skin white ; eyes shallow ; flesh white ; sprouts blue.

Foliage.—Haulm of low to medium height, spreading ; stem branching ; **leaf open, rigid, midrib purple,** especially at the base and at the bases of leaflet stalks of younger leaves ; leaflets **large, broad, dark green, glossy.**

Flower.—**Purple, with white tips,** stalks short ; buds pink.

DUNVEGAN (Paton) (Immune).

Maturity.—First Early.
Tuber.—Oval ; skin white ; eyes shallow and saucer shaped, on shoulder ; **flesh pale yellow** ; sprouts blue, scale leaves generally blue.
Foliage.—Haulm low to medium height, upright, stems slightly mottled purple ; **leaf open and rigid,** midrib light purple at base and often at bases of leaflet stalks ; **leaflet medium green, cupped** ; **secondary leaflets round** and often numerous.
Flower.—White tinged pale blue, infrequent ; buds dark purple, but bases and tips green in the young stages.

EARLY PINK CHAMPION (A. Findlay) (Immune).

Maturity.—First Early.
Tuber.—Round, dented at heel ; skin pink ; eyes medium on point, ridged ; eyebrows long ; flesh white ; sprouts pink.
Foliage.—Haulm of low to medium height, upright to spreading ; stem branching, tinged pink ; leaf **open and rigid,** midrib red at the base and at the bases of leaflet stalks ; leaflets **medium green, dull,** long and pointed ; top leaflets small, with well-marked veins.
Flower.—White ; **infrequent** ; buds pink and hairy, generally falling off without opening ; stalks short.

EARLY ROSE (Bresse) (Non-immune).

Maturity.—First Early.
Tuber.—Oval, pointed ; **skin pale pink** ; eyes shallow, numerous ; flesh white, sometimes **streaked red** ; sprouts pink.
Foliage.—Haulm low to medium height, spreading ; stem with slight tinge of colour ; **leaf open, red coloured at base** and at **bases** of leaflet **stalks** ; leaflets large, medium green ; secondary leaflets inconspicuous.
Flower.—White, small and **infrequent** ; stalks green, with purple markings.

EDINBURGH CASTLE (Paton) **(Non-immune).**

Maturity.—Second Early.
Tuber.—Oval ; skin white ; eyes shallow, close together . flesh white ; sprouts pink.
Foliage.—Haulm of medium height, spreading ; stems tinged pink ; leaf fairly open and **rigid** ; leaflets **large,** medium to dark green, **glossy, rounded** and **drooping** ; leaflets fairly blunt, with heart-shaped bases.
Flower.—White, rare.

EDINCHIP (Macnaughton) **(Immune).**

Maturity.—Early Maincrop.
Tuber.—Kidney (**long oval**) ; skin white ; eyes shallow, small ; flesh white ; sprouts blue.
Foliage.—Haulm of medium height, upright ; stem branching, slightly tinged pink, **branches thin** ; leaf **open, rigid** ; leaflets medium to dark green, **glossy,** last pair pointed forward.
Flower. White, infrequent ; buds with pink markings, infrequent ; stalks very short.

FLOURBALL (King) **(Immune).**

Maturity.—Early Maincrop.
Tuber.—Round (somewhat flat), dented at heel ; **skin pink** ; eyes medium ; flesh white ; sprouts pink.
Foliage.—Haulm medium height and spreading ; stems slightly tinged pink ; **leaf open and drooping, midrib red** ; leaflet medium green, **dull** ; secondary leaflets very few.
Flower.—White, back of petals often tinged lilac ; **berries produced very freely** ; stalks slender ; buds red-purple.

FOOTPRINT (S. T. Farish) **(Immune).**

Maturity.—Late Maincrop.
Tuber.—Round (**flat**), slightly dented at the heel ; skin white ; eyes shallow to medium, on the point ; eyebrows raised ; flesh white ; sprouts pink.

Foliage.—**Haulm tall,** upright, dense ; stem slightly mottled purple, branching ; wings slightly waved ; leaf fairly close, **rigid** ; leaflets medium green, **cupped** ; secondaries conspicuous.

Flower.—**White,** sometimes streaked red on back, **frequent** ; berries occurring ; buds pink, with green base ; stalks short.

GIGANTIC (A. R. Findlay) (Immune).

Maturity.—**Early Maincrop.**

Tuber.—**Kidney (long oval)** ; skin white ; eyes shallow ; flesh white ; sprouts pink.

Foliage.—Haulm of medium height, **open** ; stem branching, **branches spindly** ; leaf **open, rigid,** midrib faintly coloured at base of stalks ; leaflets ashy green, **small, wrinkled** ; secondaries inconspicuous.

Flower.—**White, infrequent** ; backs of petals coloured ; sepals long ; **buds dark red, frequent.**

GLASGOW FAVOURITE (Sutton & Son) (Immune).

Maturity.—**Late Maincrop.**

Tuber.—**Round to oval** ; skin white ; eyes shallow, rounded ; flesh white ; sprout pink.

Foliage.—Haulm of medium height, upright ; leaf **rigid** ; leaflets medium green, margins often waved ; secondaries conspicuous.

Flower.—**White** ; buds medium dark, with green bases and tips.

GLENALMOND (Alexander & Brown) (Immune).

Maturity.—**Late Maincrop.**

Tuber.—**Round, flat** ; skin white ; eyes shallow ; flesh pale yellow ; sprouts blue.

Foliage.—Haulm medium height to tall, with an open appearance ; stem branching, mottled purple, especially at the base ; leaf rigid ; leaflets smooth, dull, **ashy green.**

Flower.—**Creamy white** ; buds dark.

GOLDEN LAS (Wilson) (Immune).

Maturity.—Early Maincrop.
Tuber.—Oval; skin yellow; eyes shallow, saucer-shaped; **flesh yellow**; sprouts pink.
Foliage.—Haulm vigorous, spreading, tops close; stem branching; wings waved at tops; leaf **close, dull, light yellow-green, rigid**; leaflets **large, long,** pointed, markedly veined, edges **markedly waved.**
Flower.—White, large, profuse; berries occasional; **buds green**; stalks short.

GOLDEN MARVEL (Bruce and Robbie) (Immune).

Maturity.—Late Maincrop.
Tuber.—Oval, slightly dented at heel; skin white; eyes medium; eyebrows raised; **flesh pale yellow**; sprouts blue.
Foliage.—Haulm **tall, upright**; stem slightly mottled purple, branching freely, **branches generally thin**; wings broad, slightly waved at tops; leaf **open, rigid**; leaflets **large, dark green, glossy**; bases of leaflet stalks slightly tinged purple.
Flower.—Blue-purple, with large white tips; buds dark; stalks short.

GRANNISPUD (G. R. Wilson) (Immune).

Maturity.—Early Maincrop.
Tuber.—Kidney (pear-shaped); skin white; eyes shallow to medium; flesh white; sprouts pink.
Foliage.—Haulm medium height, upright, sprawling later; leaf rigid and very open; leaflets medium green and dull.
Flower.—Absent; stalk not developed.

HERD LADDIE (W. Kerr) (Non-immune).

Maturity.—Second Early.
Tuber.—Round; **skin blue-purple**; eyes shallow; flesh white **with a ring of blue**; sprouts blue.
Foliage.—Haulm of medium height, upright, sprawling later; stems not branching freely, mottled blue-purple; leaf open, drooping, light purple at base and bases of leaflet stalks; leaflets medium green, **glossy, narrow**; secondaries very inconspicuous.
Flower.—Absent; stalks very short.

INCOMER (C. Brown) (Immune).

Maturity.—Late Maincrop.
Tuber.—Oval (oblong); skin white; eyes shallow, saucer-shaped; flesh white; sprouts pink.
Foliage.—Haulm **tall, upright, dense**; stems strong, branching freely below ground, mottled red-purple; wings **broad,** waved at the tops; **leaf close**; leaflets medium green, **dull,** cupped; **secondary leaflets numerous,** often pointed backwards, and often borne on leaflet stalks.
Flower.—White, infrequent; anthers pale; stalks short; buds frequent, pink with green markings.

INTERNATIONAL KIDNEY (R. Fenn) (Immune).

Maturity.—Early Maincrop.
Tuber.—Kidney (long oval); skin pale yellow; eyes shallow, ridged; flesh yellow; sprouts blue.
Foliage.—Medium height to tall, upright; stems blue-purple, branching; leaf fairly close; **leaflet dark green, glossy, markedly round,** edges waved; secondaries large, round, numerous; **terminals drooping, tied to last pair of side leaflets in young stage.**
Flower.—Small, white; anthers pale yellow, malformed; stigma protruding; buds purple.

IRISH CHIEFTAIN (M'Kenna) (Immune).

Maturity.—Late Maincrop—very late in maturing.
Tuber.—Oval, dented at the heel; skin white; eyes medium and mostly on the point; flesh white; sprout blue; stem end and scale leaves sometimes blue coloured. Second growth runners very common.
Foliage.—Haulm of medium height to tall, strong, and branching; stem mottled purple; leaf open and rigid; midrib purple, especially at the base and at the bases of the leaflet stalks; leaflets thick, **hairy, narrow and medium green, with a dull grey appearance**; edges of the younger leaflets waved when affected with mosaic.
Flower.—Light blue-purple, tipped white, large and profuse; stalks long and purple; buds dark, with green bases.
Severe Mosaic Disease is very common.

KEAY'S CHAMPION (Keay) (Immune).

Maturity.—Early Maincrop.
Tuber.—Oval, dented at heel; skin white, **tinged pale pink at stem end**; eyes shallow, saucer-shaped; flesh white; sprouts pink.
Foliage.—Haulm tall, upright; stem slightly mottled purple, branching; wings broad; leaf **rigid**; leaflets **round, medium green, dull**; secondaries yellow-green, **round, conspicuous.**
Flower.—White, profuse; **buds green.**

KEPPLESTONE KIDNEY (Non-immune).

Maturity.—Early Maincrop.
Tuber.—Kidney (**long oval, elongated**); skin blue-purple; eyes shallow, often with raised eyebrows; **flesh yellow**; sprouts blue.
Foliage.—Haulm of medium height to tall, open; stem purple, branching; **leaf open,** short; **midrib purple**; leaflets medium to dark green, **dull,** with well-marked veins; secondary leaflets pointed.
Flower.—Creamy white, large, profuse; berries **frequent**; buds dark.

LORD SCONE (M'Naughton) (Immune).

Maturity.—Second Early.
Tuber.—Kidney (**long oval**); skin white; eyes shallow; flesh white; sprouts pink.
Foliage.—Haulm of medium height, spreading; stem branching; **leaf very open**; leaflet medium to dark green, glossy.
Flower.—Absent; buds dropping.

MAIN'S SURPRISE (Main) (Immune).

Maturity.—Early Maincrop.
Tuber.—Oval; skin white; eyes medium, deep, small; flesh white; sprouts pink.

Foliage.—Haulm of medium height, spreading ; stem mottled purple, branching fairly freely ; leaf **rigid, long,** fairly close ; leaflets medium green, **glossy** ; secondary leaflets fairly numerous, **rounded,** pointed upwards.
Flower.—**White, small, infrequent** ; buds pink.

MAIN'S TRIUMPH (Main) (Immune).

Maturity.—**Late Maincrop.**
Tuber.—**Oval** ; skin white ; eyes medium, recessed ; flesh white ; sprouts blue.
Foliage.—**Haulm tall,** upright ; stem branching, mottled dark purple ; wing slightly waved and broad ; **leaf rigid, midrib tinged red-purple,** especially at the bases of the leaflet stalks ; leaflets dark green, broad and **wrinkled** ; secondary leaflets round.
Flower.—**White, profuse** ; stalks long and strong ; buds dark.

MAUVE QUEEN (Scarlett) (Immune).

Maturity.—**Early Maincrop.**
Tuber.—**Round** ; **skin blue-purple** ; eyes shallow to medium ; eyebrows long ; flesh white ; sprouts blue.
Foliage.—Haulm of medium height, spreading ; stem strong, coloured ; leaf **open,** rigid, midrib purple, especially at the base and the bases of the leaflet stalks ; leaflets **large,** medium green, **dull,** last pair fitting round terminal.
Flower.—**White, large, profuse** ; anther's pale ; buds pink ; stalks long.

MILLAR'S BEAUTY (Immune).

Maturity.—**Early Maincrop.**
Tuber.—**Oval** ; skin white ; eyes shallow, open ; flesh white ; sprouts pink.
Foliage.—Haulm tall, upright, sprawling later ; stem strong ; wings broad ; **leaflet large, dark green, glossy,** cupped, **drooping** ; **secondaries large, round, glossy.**
Flower.—**Absent** ; stalks short—sometimes bearing leaflets ; buds pink, with long tips.

MR BRESSE (Immune).*

Maturity.—Second Early.

Tuber.—Kidney (pear-shaped, flat); skin pink; eyes very shallow; flesh white; sprouts pink.

Foliage.—Haulm of low to medium height, spreading; stem branching, tinged red-purple; wings slightly waved; leaf markedly open, rigid; midrib red-purple at base and bases of leaflet stalks; leaflets light green, pointed.

Flower.—White; infrequent; buds green-pink, with long tips.

* Some stocks which are now on the market as Mr Bresse have been found in laboratory tests susceptible to Wart Disease.

MYATT'S ASHLEAF (Myatt) (Non-immune).

Maturity.—Second Early.

Tuber.—Kidney (pear-shaped); skin white or pale yellow; eyes shallow, those on sides of tuber with raised eyebrows; flesh yellow; sprouts blue; scale leaves sometimes tinged light blue.

Foliage.—Haulm of medium height; stems tinged blue-purple, becoming darker towards maturity; wings partly waved; leaf open, short and rigid, with touches of blue-purple on midrib; leaflets dark green, glossy, with a mottled appearance; slightly wrinkled and cupped, the last pair tending to curl round the terminal.

Flower.—Blue-purple, tipped white; berries numerous and large; buds dark; stalks dark.

NORNA (A. Findlay) (Immune).

Maturity.—Second Early.

Tuber.—Kidney (long oval); skin white; eyes very shallow on point; flesh white; sprouts faint pink.

Foliage.—Resembling that of Royal Kidney; haulm medium to tall, upright, spreading later; stems branched; leaves drooping and open; midribs pink tinged, especially at the bases of leaflet stalks; medium to dark green and glossy; leaflet cupped; secondary leaflets numerous, prominent and roundish.

Flower.—Pale purple (rare); buds green, becoming dark coloured with green bases.

NITHSDALE (M'Alister) (Immune).

Maturity.—Second Early.
Tuber.—Kidney (pear-shaped); skin white; eyes shallow; flesh white; sprouts blue.
Foliage.—Haulm of medium height to tall, **upright, open**; stem strong, mottled blue-purple towards maturity; leaf **open, fairly rigid**; leaflets **large, dark green, glossy, cupped,** top leaves slightly wrinkled.
Flower.—Milky white; **frequent**; **buds green.**

ORAN BEAUTY (Immune).

Maturity.—Second Early.
Tuber.—Oval (flat); skin white; eyes shallow, ridged; flesh white; sprout pink.
Foliage.—Haulm of **low to medium height, spreading**; stem green, becoming tinged pink; wings slightly waved; leaf **open**; leaflets medium to dark green, **large, broad,** terminal leaflet generally heart shaped at base; **secondary leaflets inconspicuous.**
Flower.—Absent; buds dropping readily; stalks strong.

PEERLESS (Immune).

Maturity.—Late Maincrop.
Tuber.—Round (somewhat flat); **skin blue-purple**; eyes shallow and open; eyebrows long; flesh white; sprouts blue.
Foliage.—Haulm medium height to tall, spreading; stems mottled **dark blue-purple**; wings broad, waved at tops; **leaf open and rigid,** flat; **midrib blue and purple**; leaflets medium to dark green, **dull,** slightly wrinkled.
Flower.—White, large, profuse; buds dark.

PERTH FAVOURITE (Sutton) (Immune).

Maturity.—Late Maincrop.
Tuber.—Round (somewhat flat); skin white; eyes small, close together, on shoulder; flesh white; sprouts faint pink.

Foliage.—Haulm tall, upright ; stem slightly mottled purple, branching ; wings slightly waved, especially at top ; **leaf rigid** ; **leaflets large** and **broad, dark green** and **glossy.**
Flower.—**White, large** and **profuse** ; stalks long ; buds with dark bases.

PINK PEARL (Guthrie) (Immune).

Maturity.—Early Maincrop.
Tuber.—**Kidney,** flat ; **skin dark pink** ; eyes shallow ; **flesh deep yellow** ; sprouts pink.
Foliage.—Haulm **tall, upright** ; stem branching, mottled red-purple, branches spindly ; wings waved ; **leaf rigid, midrib red,** tinged more deeply at the base of the leaflet stalks ; **leaflets small and round, light green, dull** and **wrinkled.**
Flower.—**Absent** ; buds dropping readily.

PRIDE OF BUTE (Surprise) (Immune).

Maturity.—Early Maincrop.
Tuber.—**Kidney** (**pear-shaped**) ; skin blue-purple ; eyes shallow ; flesh white ; sprouts blue.
Foliage.—Haulm **tall** ; stem **mottled purple,** darker at base ; wings slightly waved ; leaf **open, midrib purple** ; leaflets medium green, large, **smooth.**
Flower.—**Blue-purple, tipped white, profuse** ; berries profuse ; buds dark.

RANFURLY RED (D. M'Pherson) (Immune).

Maturity.—Early Maincrop.
Tuber.—**Round** ; **skin pink** ; eyes medium to deep ; flesh white ; sprouts pink.
Foliage.—Haulm of medium height to tall, upright, stem mottled pink ; **leaf open and drooping** ; midrib tinged pink ; leaflet large, medium to dark green, glossy ; terminal leaflet drooping ; **base of midrib of leaflets pink tinged.**
Flower.—**White, large and profuse** ; buds dark ; tips of sepals long and green ; berries occasional.

RECTOR (Wilson) (Immune).

Maturity.—Late Maincrop.

Tuber.—Round ; **skin pink, with a deeper colour in the eyes** ; eyes medium to deep ; flesh white, with a tint of pale yellow ; sprouts pink.

Foliage.—Tall, upright, vigorous and branching ; leaf open and **rigid** ; **midrib markedly dark red at its base and at the bases of the leaflet stalks** ; leaflets small, dull and medium green.

Flower.—Dark red-purple, with white tips, small, frequent ; stamens often tinged deep red ; anthers and stigma protruding from the flower bud before opening ; berries produced fairly freely.

RESPONSE (C. Brown) (Immune).

Maturity.—Early Maincrop.

Tuber.—Oval ; skin white ; eyes shallow ; flesh white ; sprouts pink.

Foliage.—Haulm tall, upright ; stems branching, slightly tinged purple ; leaf open ; **leaflet large,** medium to dark green, **soft and glossy** ; margins waved ; stalks long ; **secondary leaflets numerous.**

Flower.—White, profuse ; buds with dark bases ; stalks long and strong.

RINGLEADER (R. Fenn) (Non-immune).

Maturity.—First Early.

Tuber.—Kidney (long oval) ; skin white ; eyes shallow ; flesh white ; sprouts pink.

Foliage.—Haulm of low to medium height, spreading ; stem tinged pink, especially at base ; branching ; wings frequently finely waved ; **leaf open,** drooping ; **leaflet markedly long, pointed,** medium green, **dull,** last pair overlap terminal.

Flower.—Absent ; buds with long tips ; stalks short.

ROYAL STEWART (Gordon) (Immune).

Maturity.—Late Maincrop.

Tuber.—**Kidney** (**long oval**) : skin white ; eyes shallow ; flesh white ; sprouts blue.

Foliage.—Haulm tall, spreading ; stem slightly mottled purple, **branching freely**, **branches thin** ; wings of main stem slightly waved ; leaf **rigid** ; leaflets medium green, **rounded,** slightly wrinkled, cupped, **dull** ; secondaries **round, cupped, conspicuous.**

Flower.—**Small, white,** with green tips ; anthers pale yellow ; buds pink.

SCOTTISH CHIEF (Guthrie) (Immune).

Maturity.—Early Maincrop.

Tuber.—**Round** (**flat**) ; skin white ; eyes shallow, ridged ; flesh white ; sprouts pink ; second growth (cracking) frequent.

Foliage.—Haulm of medium height to tall, **upright** ; stem wings waved ; leaf fairly open, exposing leaflet stalks ; leaflets medium to dark green, **margins waved** ; **stalks long, secondaries numerous,** generally cupped.

Flower.—**White** ; anthers pale yellow ; buds pink, falling off readily ; **stalks short.**

SHAMROCK (Immune).

Maturity.—Late Maincrop.

Tuber.—**Round,** somewhat flat, dented at heel ; **skin dark pink** ; eyes medium ; flesh white ; sprouts pink.

Foliage.—Haulm medium, upright ; stem strong, branching, mottled red-purple ; **leaf open, midrib dark red-purple** ; leaflet medium to dark green, **markedly hairy** ; stalks long, often with secondaries.

Flower.—**Large, creamy white, profuse** ; buds dark red-purple ; **stalks very long,** green, sometimes waved.

SHARPE'S VICTOR (Non-immune).

Maturity.—First Early.
Tuber.—Oval; skin white; eyes shallow; **flesh yellow**; sprouts blue.
Foliage.—Haulm of low to medium height, **spreading**; stems mottled blue-purple, **especially at base**; **leaf rigid**; leaflets **broad,** medium green, heart shaped at base, blunt.
Flower.—Pale blue, frequent; berries occurring; buds dark.

SOUTHESK (Reid) (Immune).

Maturity.—Late Maincrop.
Tuber.—Round, somewhat flat; skin white; eyes shallow and saucer-shaped; flesh white; sprouts blue.
Foliage.—Haulm tall, upright; stems branching, mottled purple; wings broad, waved, especially at the tops; **leaf open, rigid,** midrib usually faint red at the base and at the bases of leaflet stalks in early stages; **leaflet narrow,** medium to dark green, **dull, hairy,** wrinkled.
Flower.—Creamy white; stigma 4-headed; buds red-purple, **thin,** numerous.

SPION COP (Immune).

Maturity.—Early Maincrop.
Tuber.—Round; skin white; eyes shallow, saucer-shaped; flesh white; sprouts pink.
Foliage.—Haulm of medium height to tall, open, **upright**; stem mottled purple, branching, **branches spindly**; leaf **markedly open**; leaflets medium green, **glossy,** margins waved; secondaries few.
Flower.—White; anthers pale; buds pink, generally dropping readily; stalks numerous.

TEMPLAR (Wilson) (Immune).

Maturity.—Late Maincrop.
Tuber.—Oval to round (flat), of medium size; eyes very shallow; skin white; runners profuse, long, blue tinted; sprouts blue.

Foliage.—**Haulm tall, upright, with a very open appearance**; stems branching, **mottled purple, especially at base**; wings waved at top, **leaf rigid,** midrib red-purple at the base and at the bases of leaflet stalks; **leaflets small, dull, smooth, ashy green.**

Flower.—**White,** borne on fairly long stalks, **in profusion and persistent**; **berries frequent**; buds dark.

THE MAC (P. & W. Scott) (Immune).

Maturity.—**Early Maincrop.**

Tuber.—**Oval**; skin white; eyes shallow to medium; eyebrows raised; flesh white; sprouts pink.

Foliage.—Haulm tall, upright; **stems branching freely, yellowish green**; **leaf small, open** and **rigid**; leaflet light to medium green, narrow.

Flower.—**Absent**; buds red-purple, profuse, dropping.

THE MASSIE (Gavin) (Immune).

Maturity.—**Second Early.**

Tuber.—**Round, dented at heel**; skin white; eyes medium, rounded; **flesh yellow**; sprouts pink.

Foliage.—Haulm of medium height to tall, **upright,** spreading later; stems thin and **numerous, branching freely**; wings broad; leaf **open**; leaflets **narrow,** medium green, **dull and soft.**

Flower.—**White,** large, **profuse**; berries frequent; buds **green**; stalks thin and long.

THE TOWSE (Gemmel) (Immune).

Maturity.—**First Early.**

Tuber.—**Round**; **skin deep pink, with yellow blotches**; eyes **medium**; **flesh yellow**; sprouts pink.

Foliage.—Haulm of medium height, spreading; stem pink tinged and branching; leaf open; midribs pink tinged; leaflets medium green, **glossy**; **terminal drooping.**

Flower.—**Red-purple, frequent**; berries frequent; buds dark; stalks long.

Severe mosaic common.

UTILITY (Stark) (Immune).

Maturity.—Early Maincrop.
Tuber.—Round (flat), dented at heel ; **skin salmon-pink** ; eyes medium to deep ; flesh white ; sprouts pink.
Foliage.—Haulm of medium height, **spreading,** vigorous ; **stems branching freely, mottled pink** ; stem wing broad, but not markedly waved ; **leaf open and rigid,** midrib with pink markings ; **leaflets medium green, broad and dull,** slightly wrinkled, the bases of the young leaflets dark red when opening out.
Flower.—Red-purple, tipped white, infrequent ; buds with purple markings.

WHITE CITY (Stevenson) **CARNEGIE** (A. Findlay). (Immune).

Maturity.—Late Maincrop.
Tuber.—Kidney (long oval) ; skin yellow, with a slight russet appearance ; eyes few, very shallow ; **flesh pale yellow** ; sprouts pink.
Foliage.—Haulm vigorous, **spreading** and branching ; **leaf markedly long, open and rigid,** with numerous small **round** secondary leaflets which are dark green and **markedly wrinkled** ; **leaflet stalks long.**
Flower.—Red-purple, tipped white ; anthers generally pale yellow ; buds dark ; flower stalks short.

WILD ROSE (Sumner) (Immune).

Maturity.—Late Maincrop.
Tuber.—Oval ; skin white ; eyes shallow ; flesh white ; sprouts blue.
Foliage.—Haulm of medium height, **spreading** ; stem slightly mottled purple ; leaf **open** ; leaflets **decidedly arched,** medium green, **glossy** ; secondaries inconspicuous, tinged red at base of leaflet stalks.
Flower.—Absent ; buds dropping readily.

WINDSOR CASTLE (Paton) (Non-immune).

Maturity.—Second Early.
Tuber.—Oval; skin white; eyes shallow; flesh white; **sprouts blue**; scale leaves faint blue.
Foliage.—Haulm of medium height, **spreading**; stem branching, markedly **red-purple at the base**; wings waved at the top; leaf fairly close, **drooping**, midrib faintly coloured at the base and at the bases of leaflet stalks; leaflet medium green, large, **drooping**; base of leaflet heart shaped; secondary leaflets fairly numerous, **large and pointed upwards**, sometimes borne on leaflet stalks.
Flower.—Purple, with white tips; buds dark pink.

IV.—ROGUES.

BEAUTY OF BUTE (Heron) (Immune).

Maturity.—Early Maincrop.
Tuber.—Round, dented at heel; **skin white, with pink markings**; eyes large, rounded, medium to deep, often with raised eyebrows; flesh white; sprouts pink.
Foliage.—Haulm tall, open, upright, spreading later; **stem wing broad**; leaf **open, rigid**; leaflets ashy green, wrinkled, **with well-marked light-coloured veins**, arched, **margins and tips bending downwards.**
Flower.—Red-purple, tipped white, profuse; berries occasional; buds pink.

BLUE GLOSS (Immune).

Maturity.—Early Maincrop.
Tuber.—Round, dented at heel; skin white; eyes deep, recessed, numerous and with raised eyebrows; flesh pale yellow; sprouts blue; scale leaves often blue. The tubers are numerous and small, and the root has a wild appearance with long runners, sometimes distinctly coloured blue-purple.

Foliage.—Haulm of medium height to tall ; upright, spreading later ; stems mottled blue-purple, branching ; **branches thin** ; wings slightly waved ; leaf close, **short** ; leaflet medium to dark green, **glossy and markedly drooping,** especially towards maturity.

Flower.—**Blue-purple,** tipped white, frequent ; anthers pale yellow ; berries frequent ; stalks **long and slender** ; buds green, with purple base.

This rogue is found chiefly in British Queen, Sharpe's Express, Arran Comrade, Evergood, King Edward VII., Arran Chief, Great Scot and Langworthy types.

BLUE GREY (Non-immune).

Maturity.—Late Maincrop.

Tuber.—**Round** ; skin white ; eyes shallow, saucer shaped, small ; flesh white ; sprouts blue ; the tubers are small, with a tendency to second growth ; the scale leaves are blue.

Foliage.—Haulm of medium height to tall, upright, spreading later ; stems **numerous, slender** ; leaf **open, small, rigid** ; leaflet **grey-green, dull, hairy,** wrinkled ; secondaries very inconspicuous.

Flower.—Light blue, with white tips, fairly frequent ; stalks short ; buds green, with purple base.

This rogue is found chiefly in Great Scot, Langworthy types, Arran Chief, King Edward VII. and Bishop. In Fife it is common in many other varieties.

BLUE NORTHERN STAR (Non-immune).

Identical with Northern Star, except that the tubers are splashed blue.

BLUE PRESIDENT ROGUE (Non-immune).

Maturity.—Late Maincrop.

Tuber.—**Round,** dented at heel ; skin white, sometimes blotched purple round the eye and at heel ; eyes medium deep, recessed ; flesh pale yellow, **sometimes streaked blue** ; sprouts blue.

Foliage.—Haulm **tall, upright**; stem **mottled dark purple,** strong, branching; wings finely waved; leaf **open, rigid,** midrib slightly coloured in younger leaves; leaflets medium green, **dull, soft**; **secondaries very inconspicuous.**

Flower.—**Blue-purple, tipped white, profuse**; buds dark.

This rogue is found chiefly in stocks of Myatt's Ashleaf, Arran Chief and President.

BOBBIE BURNS (Non-immune).

Maturity.—**Early Maincrop.**

Tuber.—**Round**; skin white; eyes shallow, saucer-shaped; flesh white; sprouts pink.

Foliage.—Haulm of medium **height to tall, upright,** spreading later, **opening out from centre**; stem branching; **wings broad**; leaf open; leaflets **dull,** medium green, **narrow, pointed**; secondary leaflets small, fairly numerous.

Flower.—**Light red-purple, tipped a lighter shade, profuse**; buds dark; **stalks long.**

BRAVO (Non-immune).

Maturity.—**Early Maincrop.**

Tuber.—**Round, somewhat flat**; skin white; eyes medium ridged; **flesh yellow**; sprouts blue; runners numerous, blue-purple.

Foliage.—Haulm of medium height, **spreading**; stems mottled purple at base, **numerous,** thin; leaf **open**; leaflet **light green, large, dull, cupped,** margins waved; bases of leaflet stalk often spotted red-purple; secondaries inconspicuous.

Flower.—**Light blue, tipped white, fairly frequent**; berries occasional; buds green, becoming dark; stalks short.

This rogue is chiefly found in stocks of King George V., Majestic and Arran Chief.

BUCHAN BEAUTY (Immune).

Maturity.—Late Maincrop.
Tuber.—Round, dented at heel ; skin yellow, **with blue-purple markings** ; eyes deep ; **flesh yellow** ; sprouts blue.
Foliage.—Haulm **tall,** upright ; stems mottled blue-purple, especially at base, **numerous, branching freely** ; wings finely waved at tops ; leaf **open, rigid** ; midrib with a spot of dark red-purple at the base and at the bases of leaflet stalks ; leaflets medium to dark green, **edges waved, wrinkled**; secondary leaflets small, but fairly numerous.
Flower.—Dark blue-purple, tipped white ; **profuse** ; buds dark.

BURNHEAD ROGUE (Immune).

Maturity.—Early Maincrop.
Tuber.—Round, dented at heel ; skin white ; eyes medium to deep, with raised eyebrows ; flesh white, with tinge of pale yellow ; sprouts blue ; runners numerous.
Foliage.—Haulm medium to tall, spreading, **compact** ; stem branching freely ; wings slightly waved ; leaf **open, rigid** ; leaflets **light green, dull, large** ; secondary leaflets very few.
Flower.—Blue, rare.
This rogue is chiefly found in stocks of Arran Comrade, Great Scot and Arran Chief.

CATRIONA SUBSTITUTE No. 1 (Non-immune).

Maturity.—Early Maincrop.
Tuber.—Round ; **skin white, splashed blue-purple** ; eyes deep ; flesh white ; sprouts blue.
Foliage.—Haulm of medium height to tall, **upright** ; stem mottled red-purple, branching freely ; wings waved ; leaf **open and rigid,** midrib red-purple at the base and at the bases of leaflet stalks ; leaflets medium green, fairly small, broad.
Flower.—Dark blue-purple, with small tips of white, **profuse** ; buds dark.
This variety occurs as a substitute for Catriona.

CATRIONA SUBSTITUTE No. 2 (Non-immune).

Maturity.—Early Maincrop.
Tuber.—Round; skin white, splashed blue-purple; flesh white; sprouts blue.
Foliage.—Haulm of medium height to tall, upright, spreading later; stem red-purple, but markedly blue-purple at base; wings waved; leaf rigid, bases of leaflet stalks faint purple; leaflets medium green, glossy, slightly wrinkled, cupped, slightly arched, margins often waved; secondary leaflets fairly numerous.
Flower.—Not observed.

This variety occurs as a substitute for Catriona and Di Vernon, and also occurs as a rogue in these varieties.

COLOURLESS ROGUE (Non-immune).

Maturity.—Early Maincrop.
Tuber.—Round, dented at heel; skin white; eyes medium; sprouts pink; runners numerous.
Foliage.—Haulm tall, upright; stems numerous, branching freely; leaf open, very rigid, short; leaflet dark green, wrinkled, cupped, dull, markedly pointed; secondary leaflets fairly numerous, margins often waved.
Flower.—White, frequent; style long; berries occurring; buds green, large; stalks long.

This rogue is chiefly found in stocks of King George V., Majestic, Langworthy and Golden Wonder.

CONQUEST (A. Findlay) (Immune).

Maturity.—Second Early.
Tuber.—Round (flat); white, eyes shallow, ridged, on the point; scale leaves light blue; flesh white; sprouts blue.
Foliage.—Haulm of low to medium height, spreading; leaflets light to medium green, glossy, arched, drooping, generally with a purple mark at the bases of the leaflet stalks.
Flower.—White, often tinged pale blue-purple; buds with green bases.

DATE ROGUE like CHAMPION (Non-immune).

Maturity.—Late Maincrop.
Tuber.—Round, dented at heel; skin white; eyes medium, recessed; flesh white; sprouts blue; runners numerous, long.
Foliage.—Haulm **tall, upright,** spreading later; stems **markedly mottled red-purple, numerous,** fairly thin branches; wings waved; leaf **open, long, midrib markedly red-purple at the base and at the bases of the leaflet stalks**; leaflets light to medium green, **dull, margins waved.**
Flower.—Dark blue-purple, tipped a lighter shade, profuse; **berries profuse**; buds dark; stalks long.
This rogue is found chiefly in stocks of Up-to-Date and Champion.

EARLY MARKET (R. Fenn) (Gartons) (Immune).

Maturity.—Early Maincrop.
Tuber.—Oval; skin white; eyes medium; **eyebrows raised**; flesh white; sprouts pink.
Foliage.—Haulm spreading, **compact**; base of stem red; wings waved; **leaf rigid**; **leaflets yellow-green, dull, hairy, and slightly wrinkled, roundish and small**; secondary leaflets round.
Flower.—Light red-purple, with white tips, rare; flower buds hairy, pink, dropping unopened; sepals short.
This variety produces a large number of tubers of seed size.

EIGHTYFOLD (A. Findlay) (Non-immune).

Maturity.—First Early.
Tuber.—Round (flat); **skin pale purple**; eyes shallow; flesh white; sprouts blue.
Foliage.—Haulm of **medium height, upright,** spreading later; stems **dark blue-purple**; midrib purple; leaflets light to medium green, large, bright, **drooping**; secondary leaflets fairly numerous.
Flower.—Light blue; **frequent**; buds green.
This variety occurs as a rogue in Edzell Blue.

FIFTYFOLD (Immune).

Maturity.—Second Early.
Tuber.—Oval; skin white; eyes shallow; flesh white; sprouts pink; **scale leaves pink.**
Foliage.—Haulm of medium height; stem branching, mottled red-purple; leaf fairly close; leaflets medium to dark green, **dull, round,** terminal drooping; secondary leaflets **numerous, round.**
Flower.—White; fairly frequent; berries occurring; buds dark.
Aucuba mosaic is common.

FORTYFOLD (Non-immune).

Maturity.—Early Maincrop.
Tuber.—Round, dented at heel; **skin yellow, splashed purple;** eyes open, medium to deep; flesh white; sprouts blue.
Foliage.—Haulm of medium height, upright, but becoming straggling; tops sulphury; **stems numerous,** practically uncoloured, except at base; wings slightly waved; leaf **small, compact**; leaflets light **green,** dull, **very small,** arched, last pair fitting round terminal.
Flower.—Blue-purple, very rare; **buds green,** stalks short.
Village Blacksmith is identical with Fortyfold, except for its russet tubers.
White Fortyfold, also known as Shetland Early Regent, is identical with Fortyfold, except for its white tubers.

GREGOR CUPS (Immune).

Maturity.—Late Maincrop.
Tuber.—Round, dented at heel; **skin pink**; eyes deep; flesh white; sprouts pink.
Foliage.—Haulm **tall, coarse, open**; stem strong and branching freely, mottled red-purple; wings markedly waved; leaf rigid, short; midrib red-purple, especially in younger leaflets; leaflets medium to dark green, wrinkled, often with mosaic appearance, edges waved.
Flower.—White, with green tips, very rare; buds dark, dropping readily.

HARBINGER (Shakeshaft) (Non-immune).

Maturity.—First Early.

Tuber.—Round (flat), dented at heel; skin white; eyes saucer-shaped, generally on point; flesh white; sprouts pink.

Foliage.—Haulm **low** and **spreading**; stem becoming slightly pink tinged; leaf open and **drooping**; leaflets **light green and drooping, dull,** but becoming bright at maturity, thin and delicate, **very large, especially the terminal leaflet,** last pair lying over terminal.

Flower.—Absent.

JOHN BULL (Non-immune).

Maturity.—Early Maincrop.

Tuber.—Round, dented at heel; skin white **with pink markings**; eyes shallow, open, large; eyebrows long and slightly raised; flesh white; sprouts pink.

Foliage.—Haulm **tall, upright**; stems branching; wings inconspicuous; leaf **close, rigid, pointed upwards**; leaflets medium to dark green, **cupped,** stalks long; **secondaries numerous.**

Flower.—Purple, tipped white; buds dark.

K. OF K. (A. Findlay) (Immune).

Maturity.—Early Maincrop.

Tuber.—Oval, dented at heel; skin white, splashed or **dotted red about the eyes**; eyes small, saucer-shaped; flesh tinged lemon, soft; sprouts pink.

Foliage.—Erect, spreading later; **stems numerous, slender, with a pink tinge**; **wings waved**; leaf open, midrib often pink; leaflets small and dull, **light green.**

Flower.—Light red-purple, tipped white; infrequent; sepals long and pointed; buds pink.

LORD ROSEBERY (Non-immune).

Maturity.—Second Early.

Tuber.—Round; **skin deep pink**; eyes shallow to medium, on point; flesh white; sprouts pink.

Foliage.—Haulm of medium height, spreading, with flat tops: stem branching freely, mottled red-purple; leaf open, midrib red at the base and at the bases of leaflet stalks: leaflets long, medium to dark green, glossy, **margins waved.**

Flower.—Red-purple, tipped white; large and **very profuse**; berries frequent; buds dark, sometimes clustered; stalks long and leafy.

LYMM GRAY (Non-immune).

Maturity.—Second Early.

Tuber.—Round, somewhat flat; skin white, but **heel pink** when immature; eyes small, deep; flesh white; sprouts pink.

Foliage.—Haulm of medium height to tall, **compact,** with slightly drooping tops; stems tinged red-purple; leaf fairly open, **wings broad,** with large waves, midribs frequently tinged purple at the bases of leaflet stalks; leaflets medium green, **dull,** thick, **soft**; secondaries fairly numerous.

Flower.—Light red-purple, tipped white, very rare; buds pink, with green bases, dropping readily; stalks short.

MAGNIFICENT (A. Findlay) (Non-immune).

Maturity.—Early Maincrop.

Tuber.—Oval; skin white; eyes deep; flesh white; sprouts pink.

Foliage.—Haulm of medium height, **spreading,** vigorous; stem branching; leaf open; leaflets **dark green, dull, large, rounded, hairy, thick,** slightly wrinkled, **last pair fitting round terminal**; secondaries large.

Flower.—White; **very infrequent**; **buds green,** dropping readily.

MAGNUM BONUM (Clark) (Non-immune).

Maturity.—**Late Maincrop.**
Tuber.—**Kidney (long oval)** ; skin white ; eyes shallow and on the point ; flesh white ; sprouts faint pink.
Foliage.—Haulm **tall and upright,** branching fairly freely ; wings of stem waved ; leaf open ; midrib **with red marks at its base and at the bases of the leaflet stalks** ; leaflets medium green ; **lower leaflets having a thin appearance** ; terminal leaflet drooping.
Flower.—**Red-purple, tipped white, fairly frequent** ; buds red-purple with green bases and tips.
Mosaic disease very common.

MARQUIS OF BUTE (Immune).

Maturity.—**Second Early.**
Tuber.—**Round** ; skin white, **pink at eyes** ; eyes medium ; flesh white ; sprouts pink.
Foliage.—Haulm of medium height to tall, spreading ; stems strong ; wings broad ; **leaf close** ; leaflets **large, round,** thin, medium green and **glossy,** arched, with a slight wrinkle ; secondary leaflets **large, glossy.**
Flower.—**White** ; **buds green.**

MAUD MEG (Immunity not determined).

Maturity.—**Late Maincrop.**
Tuber.—**Oval to long oval** ; skin **dark red** ; eyes shallow to medium, on point ; eyebrows long and raised ; **flesh yellow** ; sprouts pink.
Foliage.—Haulm of medium height to tall, spreading ; stem mottled red-purple, branching freely ; leaf **open, rigid, midrib red-purple** ; leaflet medium green, cupped, fleshy appearance, **secondaries small, numerous.**
Flower.—**Red-purple, with white tips streaked purple** ; anthers malformed ; stalks short and sometimes bearing leaflets ; buds dark, sometimes clustered ; berries occur.

MAYBOLE ROGUE (Immune).

Maturity.—First Early.
Tuber.—Round ; skin white ; eyes deep ; sprouts pink.
Foliage.—Haulm **low, spreading** ; leaf long ; leaflets markedly **large,** light to medium green, **cupped, glossy, thin,** with **slightly waved margins.**
Flower.—Light red-purple, with large tips of white, infrequent.
This rogue is found chiefly in stocks of Puritan and Epicure.

MOSAIC ROGUE (Immune).

Maturity.—Second Early.
Tuber.—Oval, pointed ; skin white ; eyes medium to deep ; **flesh yellow** ; sprouts pink.
Foliage.—Haulm of medium height, **upright,** spreading later ; stems **numerous,** with **numerous thin branches** ; leaf **open, short** ; leaflets medium green, thin, **narrow ; secondaries inconspicuous.**
Flower.—White, profuse ; berries profuse ; **buds green** ; stalks long and weak.
Mosaic is very severe on all plants.
This rogue is found chiefly in stocks of Epicure.

NONESUCH (J. Clark) (Non-immune).

Maturity.—First Early.
Tuber.—Round, somewhat flat, dented at heel ; skin white ; eyes shallow ; flesh white ; sprouts pink.
Foliage.—Haulm of medium height, **upright,** sprawling later ; stems tinged red-purple, markedly angular ; leaf **close, short** ; leaflets **medium to dark green, glossy, markedly drooping, the whole leaf having a closed fist appearance, wrinkled** ; terminal leaflet in the young plant sometimes joined to side leaflet.
Flower.—Not noted ; berries very occasional.
This rogue is found chiefly in stocks of Epicure.

ORANGE ANTHER SUBSTITUTE (Non-immune).

Maturity.—Late Maincrop.
Tuber.—**Round,** dented at heel ; **skin pale pink** ; eyes medium to deep ; flesh white ; sprouts pink.
Foliage.—Haulm **tall,** vigorous ; stem strong, tinged pink ; leaf rigid, fairly close ; leaflets medium green, with a **glossy, waxy appearance.**
Flower.—**White, frequent** ; **anthers orange** ; berries occurring occasionally ; buds dark.

This rogue is found chiefly in stocks of Kerr's Pink, and occurs also as a substitute for Kerr's Pink.

ORKNEY ROGUE (Immune).

Maturity.—Early Maincrop.
Tuber.—**Oval** ; skin white ; eyes medium ; sprouts pink.
Foliage.—Haulm **tall, upright,** spreading later ; stem **branching freely, branches thin** ; wings broad, waved at tops ; leaf **open, rigid** ; leaflets medium green, **dull, soft,** margins waved.
Flower.—**Dark red-purple, tipped white, large, profuse** ; **berries profuse** ; buds purple, with green bases ; stalks long.

This rogue is found chiefly in stocks of Up-to-Date in Orkney.

PEACHBLOOM (Immune).

Maturity.—Late Maincrop.
Tuber.—**Round,** dented at heel ; skin white, splashed **deep pink** ; eyes white and medium deep ; flesh white ; sprouts pink ; runners numerous.
Foliage.—Haulm tall, **upright, open** ; stem **tinged red-purple, with numerous thin branches** ; **leaf open, midrib distinctly red-purple at the base and at the bases of leaflet stalks** ; leaflets medium green, glossy, last pair of leaflets well clear of terminal.
Flower.—**Dark red-purple, tipped white, large, profuse** ; **anthers loose.**

This rogue is found chiefly in stocks of Great Scot, King Edward VII., Golden Wonder and Langworthy.

RAEBURN'S GREGOR CUPS (Immune).

Maturity.—Early Maincrop.

Tuber.—**Round**; **skin pink**; eyes medium; flesh white; sprouts pink.

Foliage.—Haulm of medium height to tall, **upright**; stems **mottled dark red-purple,** branching fairly freely; wings of main stems slightly waved; leaf **open, rigid,** midrib dark red-purple; leaflets medium green, dull; **secondaries very inconspicuous.**

Flower.—**Red-purple, with large tips of white, profuse**; buds red-purple.

This rogue is found chiefly in stocks of Kerr's Pink.

READING RUSSET (R. Fenn) (Non-immune).

Maturity.—Second Early.

Tuber.—**Round** (flat); **skin pink**; eyes shallow, close together; flesh white; sprouts pink.

Foliage.—Haulm of low to **medium** height, **spreading**; stem mottled red-purple; **leaf open,** slightly drooping; leaflets medium green, **long, pointed,** last pair overlapping terminal; secondary leaflets fairly numerous towards maturity.

Flower.—**White**; **frequent**; anthers orange; **berries occurring**; buds dark.

ROCKS (Immune).

Maturity.—Late Maincrop.

Tuber.—**Round,** deeply dented at heel; skin white; eyes on point, **deeply recessed**; flesh white; sprouts pink.

Foliage.—Haulm **upright,** tall, spreading later; stems tinged pink towards maturity, with **numerous thin, green branches**; leaf open, **rigid, upright**; leaflet medium to dark green, glossy and **wrinkled.**

Flower.—**Red-purple, with white tips, very rare**; buds pink.

ROGUE like ENTENTE (Non-immune).

Maturity.—First Early.

Tuber.—Round to oval; skin white; eyes shallow; flesh pale lemon; sprouts blue.

Foliage.—Haulm of **low to medium height, spreading**; stems **numerous, thin, mottled blue-purple**; leaf **open**; leaflets medium green, **narrow**; secondary leaflets very inconspicuous.

Flower.—Absent; stalks very short, infrequent.

This rogue is found chiefly in stocks of Arran Comrade.

ROGUE like EVERGOOD BOLTER (Immune).

Maturity.—Early Maincrop.

Tuber.—Oval; skin white; eyes medium; flesh white; sprouts pink.

Foliage.—Haulm **upright**; stems branching **freely,** slightly tinged pink; leaf **short, open**; leaflet dark green, dull, thick, **hairy, narrow.**

Flower.—Absent; buds **pink, hairy, numerous,** dropping readily; sepals generally long.

This rogue is found chiefly in stocks of King Edward VII.

ROGUE like GREAT SCOT (Immune).

Maturity.—Early Maincrop.

Tuber.—Round, dented at heel; eyes medium, on point; **skin pale pink**; flesh white; sprouts pink.

Foliage.—Haulm of medium height to tall, upright, spreading later; stem mottled red-purple, branches thin, fairly numerous; leaf open, midrib red-purple at the base and at the bases of leaflet stalks; leaflets thin, **dark green, glossy,** cupped, **terminal leaflet droops**; secondary leaflets fairly numerous.

Flower.—White, profuse; anthers orange; berries frequent.

This rogue is found chiefly in stocks of Kerr's Pink.

ROGUE like MAY QUEEN (Non-immune).

Maturity.—First Early.
Tuber.—Oval; skin white; eyes shallow; flesh white; sprouts blue.
Foliage.—Haulm of low to medium height, **spreading**; stem mottled blue-purple; wings broad; leaf **rigid,** fairly open; leaflets **large, oblong,** heart-shaped at base, medium green, **glossy, cupped,** often with waved margins, last pair fitting round terminal.
Flower.—Absent; stalks short; buds clustered.
This rogue is found chiefly in stocks of Duke of York, May Queen and Majestic.

ROGUE like MYATT'S ASHLEAF (Immune).

Maturity.—Second Early.
Tuber.—Round; skin white; eyes shallow to medium; **flesh pale yellow**; sprouts blue.
Foliage.—Haulm of medium height, **spreading**; stems slightly tinged purple, **numerous**; **wings waved**; leaf **open, rigid**; leaflets **small, dark green,** dull, slightly wrinkled, margins waved.
Flower.—Dark blue-purple, with large tips of white, profuse; **berries profuse,** pointed; buds large, dark.
Mosaic Disease is severe on all plants.
This rogue is found chiefly in stocks of Duke of York, King George V, Arran Chief, Kerr's Pink, Langworthy and Golden Wonder.

ROGUE like SOUTHESK (Non-immune).

Maturity.—Late Maincrop.
Tuber.—Round; skin white; eyes shallow; flesh white; sprouts blue.
Foliage.—Haulm of medium height to tall, **upright**; stem strong, blue-purple at base; wings finely waved; leaf **open, rigid**; leaflet medium green, **dull,** pointed, margins often waved.
Flower.—White; buds dark; stalks long.
This variety is found in stocks of Crusader.

ROGUE like TEMPLAR (Immune).

Maturity.—Late Maincrop.

Tuber.—Oval ; skin white ; eyes shallow ; flesh white.

Foliage.—Haulm of medium height to tall ; stem mottled red-purple, **branching freely** ; leaf **open, rigid** ; leaflets medium to dark green, leathery, wrinkled.

Flower.—White, large, profuse ; buds green-purple to dark purple ; **stalks long.**

This rogue is found chiefly in stocks of Crusader.

ROUGH-LEAVED ROGUE (Immune).

Maturity.—Late Maincrop.

Tuber.—Oval, pointed at both ends ; skin white ; eyes deep ; flesh white ; sprouts pink.

Foliage.—Haulm **tall, upright, dense** ; stems mottled red-purple, branching, **branches thin** ; leaf **rigid,** red-purple at the base and at the bases of leaflet stalks ; leaflet medium green, **dull, rounded, wrinkled, arched.**

Flower.—Absent ; buds very small, dropping readily ; stalks short.

This rogue is found chiefly in stocks of Katie Glover, Great Scot, Majestic, K. of K. and Northern Star.

SHARP'S PINK SEEDLING (Immune).

Maturity.—Early Maincrop.

Tuber.—Round ; **skin pink** ; eyes shallow ; flesh white ; sprouts pink.

Foliage.—Haulm of medium height to tall ; stems numerous, tinged red-purple, especially at base ; leaf **open, rigid,** midrib dark red ; leaflets round, distinctly pointed, **medium green, dull** ; secondary leaflets **small, but often numerous,** projecting upwards.

Flower.—Red-purple, tipped white, profuse ; buds dark ; stalks long.

STIRLING CASTLE (A. Paton) (Non-immune).

Maturity.—Early Maincrop.

Tuber.—Oval; skin white; eyes shallow, open; flesh white; sprouts pink.

Foliage.—Haulm of medium height to tall, spreading later, with drooping tops; stems slightly tinged pink; leaf drooping, fairly close; leaflets light to **medium green, dull,** wrinkled; terminal leaflet drooping; secondary leaflets numerous, often on leaflet stalks.

Flower.—Absent; buds pink, dropping readily; stalks short.

SUMMIT (Non-immune).

Maturity.—Late Maincrop.

Tuber.—Oval; skin white; eyes medium to shallow; flesh white; sprouts pink.

Foliage.—Haulm **tall,** upright, vigorous; **stems** numerous, mottled red-purple, especially at base; wings slightly waved; leaf **short, open, rigid,** midrib coloured at the base and at the bases of leaflet stalks; leaflets medium green, **dull.**

Flower.—White, profuse; anthers pale and malformed; **buds** dark.

SUTTON'S EARLY REGENT (R. Fenn) (Non-immune).

Maturity.—Second Early.

Tuber.—Round, somewhat flat; skin white; eyes shallow, small; flesh white; sprouts pink.

Foliage.—Haulm **low to medium height,** spreading, vigorous; stems thin, mottled pink; leaf fairly close; leaflets **light green, dull**; **secondary leaflets numerous, round.**

Flower.—White; berries occasional; buds dark, with green tips.

TINTED FLOWERED ROGUE (Non-immune).

Maturity.—Second Early.

Tuber.—Round ; **skin white** ; eyes shallow to medium ; flesh white ; sprouts pink.

Foliage.—Haulm of medium height, spreading, **compact** stems fairly numerous, branching ; leaf **open** ; leaflets medium green, fleshy, margins waved ; secondary leaflets small, few.

Flower.—Light pink, with large tips of white, profuse ; buds with pink markings ; stalks long.

This rogue is found chiefly in stocks of Great Scot in East Lothian.

WAVERLEY (Dobbie) (Non-immune).

Maturity.—Early Maincrop.

Tuber.—Kidney (long oval) ; **skin pink** ; eyes shallow ; flesh white ; sprouts pink.

Foliage.—Haulm **very tall,** stem strong, mottled pink ; wings waved ; leaf **fairly close,** midrib pink at the base and at the bases of leaflet stalks ; leaflets medium green, glossy, with fleshy appearance and with waved margins, **large, especially the terminal** ; secondary leaflets numerous, often on leaflet stalks.

Flower.—White, small, **not very frequent** ; buds pink, with green bases.

YAM (Non-immune).

Maturity.—Late Maincrop.

Tuber.—Round, dented at heel ; **skin brick-red** ; eyes medium to deep, recessed ; eyebrows long, raised ; **flesh yellow** ; sprouts pink.

Foliage.—Haulm **tall, upright** ; stems branching freely, **mottled red-purple** ; wings waved ; leaf **markedly open,** midrib dark red-purple ; leaflet medium to dark green ; secondaries few.

Flower.—White, profuse ; anthers orange ; **buds greenish.**

LEAF-ROLL DISEASE.

A typically diseased plant of Up-to-Date.

Reprinted from the Journal of the Department of Agriculture, Dublin,
Vol. xxii., No. 3.

V.—THE PREVENTION OF LOSS CONSEQUENT ON DISEASE AND MISHANDLING.

The production of a good stock requires care and thought at all stages in the growth and handling of the crop from which the stock is taken. The previous sections have indicated the need of supplying stocks true to type and free from admixture, have shown how mixing of stocks commonly occurs, and have given directions for identifying varieties and detecting rogues. It remains to point out the principal features of the diseases which lessen the value of a seed stock, to state how these diseases should be combated and finally to give recommendations in regard to the general handling of the crop with a view to the distribution of the seed in a sound, vigorous and healthy condition.

The chief diseases that reduce the produce of potato crops are Wart Disease, the epidemic Blight and the degeneration diseases comprising Leaf Roll and those in the Mosaic group.

The danger from Wart Disease is being steadily overcome by the use of immune varieties, and it may be only the matter of a few years before susceptible varieties are entirely superseded by immune sorts, thus rendering the disease of minor importance.[1]

Blight, which is commonly known as "the disease," causes great havoc in the field during warm, moist seasons, the loss being continued during storage. The best preventives consist of suitable, adequate and timely spraying, the planting of varieties possessing a fair degree of resistance,[2] and the lifting of the crop when the soil is dry. An additional and necessary precaution in the case of a badly diseased crop is to delay lifting until three weeks after the death of the shaws. Cutting of the shaws is also of great value in arresting the progress of the disease, and if carried out before disease appears on the leaves should to a great extent prevent the tubers from being affected.

Degeneration Diseases.

The degeneration diseases, Leaf Roll and Mosaic, are of widespread occurrence in the principal ware potato-growing districts, where the potato-fields are close together. The

[1] The immunity or susceptibility of each variety is noted in Sections II., III. and IV.

[2] A list of resistant and susceptible varieties is given on p. 102.

effects of these diseases are serious, badly-affected plants generally producing a crop of a few small tubers, which, if used for seed, increase the proportion of affected plants in a stock. The diagnosis of these diseases often presents great difficulty. The grower is advised to familiarise himself with typical healthy specimens of the variety with which he is dealing. When once he is sure of the type of a healthy plant he will have less difficulty in detecting and diagnosing unhealthy specimens (see illustration, Plate II.). The following brief notes indicate the chief features of these diseases. In these notes the word " primary " applied to symptoms of a disease denotes those which occur in the year of infection, while the word " secondary " denotes those which occur in the year following infection. Occasionally, however, secondary symptoms occur in the year of infection and frequently primary symptoms do not appear.

Leaf Roll.—In the secondary stages of the disease, as exhibited on typically-affected plants, the lower leaves are rigid and the leaflets of those leaves are rolled upwards and inwards, giving the leaflet a funnel-like or spoon-shaped appearance. The rolled leaflets are crisp and dry, and in some varieties particularly, often purple or bronze coloured. This rolling occasionally spreads to leaflets in the upper parts of the plant. The whole plant may be reduced in size and may even, when infection is severe, become dwarfed and stunted. In the primary stages the upper leaves are erect and rigid, and the leaflets of those leaves are rolled in a fashion similar to that described above. Particular care is necessary to distinguish the symptoms of true leaf roll from the leaf rolling caused by Rhizoctonia, Blackleg, Verticillium Wilt, insect and mechanical injuries to the stems and unfavourable growth conditions. In true secondary leaf roll the lower leaflets are chiefly affected, and they are dry and crisp ; in the other conditions mentioned above the top leaves are mainly affected, and they are limp. In Scotland leaf roll is not nearly so common as Mosaic diseases.

Mosaic Diseases.—It is now considered that there is more than one disease in the mosaic group, the chief of these being ordinary Mosaic and Crinkle, the others including Aucuba Mosaic and Stipple-Streak. The symptoms of these diseases cannot be adequately described to apply correctly to all varieties under all conditions ; they are exhibited differently according to the variety on which they occur.

MOSAIC DISEASE.

A diseased plant (left) and a healthy plant (right) of Irish Chieftain.

PRESIDENT.—(1) *Left*, Leaf roll; (2) *Centre*, Slight mosaic; (3) *Right*, Severe mosaic. These three plants were grown in

Ordinary Mosaic.—The individual leaflets, instead of being uniformly green, are faintly mottled or spotted in various shades of pale green. In plants mildly or recently affected, mottling of the foliage may be the only sign of the disease, but, generally, as the disease progresses, wrinkling and puckering of the leaflets becomes more or less evident, as does waving of leaflet margins. On the other hand, faint mottling alone does not necessarily denote that the plant is affected with ordinary mosaic. A mosaic plant is generally easily recognised among healthy plants by its more open habit coupled with a paler colour of the foliage, by the mottled appearance of the foliage, by the wrinkling of the leaflets, by the waviness of the margins of the leaflets, by a reduction in the size of the leaflets, or by a combination of two or more of these symptoms (see illustration). There may also be a general reduction in the size of the plant. The symptoms are never present on one leaflet only; at least a whole leaf is affected. Diagnosis is most difficult when plants are only mildly affected. Further, the mottling may be completely masked in hot sunny weather, and it is most evident in cool, dull or moist weather.

Crinkle.—Plants affected with this disease resemble dwarfed plants severely affected with ordinary mosaic. Crinkle, however, is differentiated from ordinary mosaic by more diffuse mottling and more pronounced wrinkling, in which the depressions are chiefly along the veins. The most marked symptom of all is that the margins and especially the tips of the leaflets are curled downwards. About the centre of the midrib of the leaflet on the underside there is usually a dead brown area. Similar brown discoloration may develop in minute isolated spots of the leaf surfaces, giving the leaf a finely-spotted appearance. The plant is notably dwarfed and the flowering capacity greatly reduced. The lower leaves generally drop prematurely, and affected plants are always much earlier in maturing. This disease is quite common, and clear examples of it can often be seen in crops of Field Marshal, although it is by no means confined to that variety.

Aucuba Mosaic takes its name from the conspicuous bright-yellow spotting or blotching which is characteristic of the common ornamental shrub, *Aucuba japonica variegata*, and which is frequent on some potato plants. The symptoms persist throughout the season. Aucuba mosaic is of little importance, and is more or less confined to certain early varieties, such as Ninetyfold, Fiftyfold, Catriona and King George V.

Stipple-Streak.—An alternative name for this disease is Leaf Drop Streak. This disease, as evidenced by the following symptoms, is probably not of common occurrence in Scotland. Possibly there are different forms of Streak, and, at any rate, the symptoms differ greatly on different varieties, at certain stages even approximating those of Crinkle on some varieties. In typical Stipple-Streak, such as may be seen on the variety Duke of York, the primary symptoms take the form of angular dark brown spots, apparent on both sides of the leaflets. These spots join the veins and run down them into the leaf stalk and stem in the form of a deep-seated dark streak. Affected leaflets shrivel up and die. When the whole leaf is dead it remains hanging to the plant. The tubers generally have blisters around the eyes. When the tubers from primarily-affected plants are grown, the resulting plants are dwarfed, with brittle, brown-stained stems and small, downward curling, puckered leaves, the lowest of which soon drop off. Eventually all the leaves drop off, giving the plant the appearance of a miniature palm tree.

Other Mosaic Diseases.—Another form of mosaic, provisionally called Marginal Leaf-Rolling Mosaic, is very common in stocks of Arran Chief, Katie Glover and Catriona. Affected plants have the symptoms of ordinary mosaic, but in addition the margins are upturned and are very pale. Still other forms of mosaic have been described, but it is not necessary to give details.

Mixture of Diseases.—The foregoing notes have given descriptions of the symptoms of single diseases, but it frequently happens that a plant is affected with more than one disease. Indeed, it is considered that much of the degeneration in the potato-growing areas, especially in England, is the result of the effects of mixtures of diseases, plants receiving new and additional infections when transferred to that region. Mixtures of disease are more destructive than any one of the diseases in the mixture occurring singly. Ordinary mosaic with leaf roll or crinkle forms a very destructive combination. The symptoms of the diseases in a mixture are not so clearly defined as are those of the single diseases. The term Curly Dwarf, previously applied to denote a single disease, very aptly describes symptoms commonly resulting from mixed infections. The destructiveness and common occurrence of mixed diseases should be better realised.

Plate V.

One of the five British Queen plants which were infected with Leaf-roll through the sprouts by means of Aphides (Greenfly).

eprinted from the Journal of the Department of Agriculture, Dublin, Vol. xxv., No. 2.

Plate VI.

Healthy control plant derived from other half of same tuber which produced plant Plate V.

Reprinted from the Journal of the Department of Agriculture, Dublin, Vol. xxv., No. 2.

Spread of the Diseases.—There is present in the sap of diseased plants an infective principle known as a virus, which is capable of creating the same disease in another plant when it reaches the sap of the latter by inoculation or grafting. In the field, greenfly and other sucking insects carry virus from diseased plants and inoculate it into other plants. Greenfly are also capable of conveying virus from sprout to sprout when tubers are in sprouting boxes in storage. No other natural means of transferring infection are known. Greenfly thrive best and multiply most rapidly in early districts and in warm, low-lying or sheltered localities or positions. The more greenfly present in a crop containing, or in proximity to, diseased plants, the greater are the chances of infection being carried about. No variety is known to be immune from any of the diseases, but some varieties are less affected by infection than are others, and can be regarded as tolerant or resistant.[1] A variety that is resistant to one of these diseases is not necessarily resistant to any of the other diseases, although there are some varieties that possess a fair amount of general resistance. It has been found that some plants may carry virus and yet show no symptoms of disease. These plants are called "carriers," and the disease is said to be masked. It is not known whether "carriers" occur frequently or not. The virus spreads throughout an affected plant and soon reaches the tubers. All subsequent produce derived from the stock of that plant is permanently and incurably infected. There are no practicable means of getting rid of the virus in tubers or growing plants. Proximity to diseased plants appears to be the chief factor in the infection of stocks. For this reason, seed stocks should be acquired from districts where potato fields are widely separated.

Control Measures.—In view of all these facts the following policy is advocated for growers in districts where the potato-fields are close together. A healthy stock of a variety should be acquired from hill land or from the north. The more resistance to disease the selected variety possesses the greater are the chances of obtaining a really healthy stock, and the greater, too, are the chances of maintaining the stock in a healthy condition in its new situation. The maintenance of a healthy seed stock from year to year is, however, more dependent on the environmental conditions. If greenfly and other insect carriers are

[1] The varieties relatively susceptible to Leaf Roll and to Mosaic are indicated on page 102.

not abundant, all obviously-diseased plants should be removed from a part or the whole of the stock, but, unless the diseased plants are few in number, the cost of their removal will soon exceed the additional cost of bringing in a new healthy seed stock for the following year. The policy advocated for the seed grower in the hills or the north is as follows :—

1. *Propagation of healthy stocks.*—Where insect carriers are not common, it is sufficient to obtain a healthy stock and to multiply it, continually roguing out degenerate plants. It is in very late humid districts that this policy is likely to be most successful.

2. *Selection of healthy plants by specialists and isolation of plants.*—If insect carriers occur, the following alternative policy is suggested. Healthy plants should be selected from a good stock in a late district. The produce of each plant should be planted out separately in groups per plant. The best way to do this is to plant out the produce in a turnip crop or other root crop, and to have a distance of at least ten yards between each group. The seed stock should be built up only from the groups in which no disease appears. When in possession of a healthy stock the grower should examine it periodically throughout the growing season and remove all plants showing symptoms of disease.

Stock Seed.—As a measure of control of the diseases described above, a stock seed report is granted by the Board of Agriculture for Scotland in respect of crops which are self-contained, free from rogues and of the highest possible grade of health. This report sets a standard which should be the aim of all seed growers. Stocks of new varieties should be reared as stock seed, and should not be grown in sheltered fields in close proximity to diseased plants.

Other Diseases.

The diseases already dealt with are those which threaten the greatest danger to potato-growing, but they are by no means the only ones which attack potatoes. Particular mention requires to be made of Corky Scab and Blackleg.

Corky Scab (*Spongospora subterranea*).—The disease is confined to the tubers and roots. It does serious damage to the part of the flesh next the skin, and it may cause the tuber to be markedly mis-shapen. It is perpetuated by spores

carried on the seed tubers or left in the soil. It is most severe in wet seasons and in gardens and allotments in which potatoes are grown annually and on farms in areas where feeding of brock potatoes to pigs and dairy cows is extensively practised. It is aggravated by applications of lime.

Blackleg[1] is a bacterial disease which appears throughout the whole summer and causes the foliage to wilt and the base of the stems to rot and turn black. The bacteria pass down from the stem into the tubers, causing them to rot, especially in wet conditions. This rot may spread from tuber to tuber in the pit. The disease is perpetuated by planting affected seed tubers which have not rotted.

The remaining diseases are either of infrequent occurrence or else do not cause a great deal of harm when present. **Rhizoctonia solani** is a superficial skin fungoid parasite which is most commonly noticed as an aggregation of small black masses of mycelium on the skin of the tubers. In the growing season it forms a white collar round the base of the stem, and may cause wilting. **Botrytis, Sclerotinia, Verticillium Wilt,** and **Pink Rot** are diseases of the foliage. The two last-named diseases affect the condition of the tubers. **Ordinary surface scab** (*Actinomyces* spp.): **Dry Rot** (*Fusarium caeruleum*), a disease which appears during storage, and which specially affects early kidney varieties: **Skin Spot** (*Oospora pustulans*), a widely spread parasite which develops during storage and which disfigures much of the ware in this country; **Sprain or Internal Rust Spot**: and **Silver Scurf** (*Spondylocladium atrovirens*) affect the tubers only. Rhizoctonia solani, Verticillium Wilt, Pink Rot, Skin Spot, Sprain and Silver Scurf carry the infection by the seed tubers, although tubers affected with Skin Spot or Sprain do not necessarily give rise to progeny similarly affected, soil conditions being also a factor in infection. Tubers affected with Dry Rot contaminate the soil, which can then infect new tubers. Botrytis and Sclerotinia are perpetuated by small masses of fungoid tissue, called Sclerotia; as these are present on diseased haulms, burning of such haulms is advisable.

There are other considerations besides diseases which affect the value of a seed stock, although the influence of such is confined to the season in which the tubers are planted. Careless or improper digging, storing or dressing detracts from the

[1] A list of the varieties susceptible to Blackleg is given on p. 103.

value of seed tubers. If the tubers are damaged during lifting, it is easier for parasites to attack them. Severe chilling at temperatures just below freezing-point, though insufficiently low to kill the tubers, may yet lead to their death before growth is established, and blanking may result. Heating of the seed tubers causes excessive sprouting, which, if not checked, will tend to exhaust the tubers and cause less vigorous brairding. The best temperature for storing potatoes is between 36° F. and 40° F.

Summary.

The losses due to diseases can largely be prevented by such control measures as have been advocated. In particular, the planting of good healthy stocks is well worth while. The deterioration of stocks was at one time supposed to be the natural and inevitable consequence of old age, but ample evidence is now available to show that the deterioration observed was due to the effects of infection with leaf roll and mosaic, and that varieties can be maintained in a high state of productivity provided the seed stocks are grown and handled in suitable conditions.

Varieties whose tubers are relatively resistant to infection with Blight (*Phytophthora infestans*) :—

Arran Consul, Evergood, Rhoderick Dhu, President, Lochar, Irish Queen, Kerr's Pink, Champion, Irish Chieftain, Langworthy, Golden Wonder, Arran Victory.

Varieties whose tubers are susceptible to infection with Blight (*Phytophthora infestans*) :—

All common first-early varieties, and British Queen, Katie Glover, Arran Comrade, Catriona, King Edward VII., Up-to-Date, Field Marshal, Sutton's Abundance, King George V. and Great Scot.

Varieties which appear to be relatively susceptible to the effects of infection with Leaf Roll* :—

British Queen, Katie Glover, Arran Consul, Kerr's Pink, Duke of York, Majestic, King George V.

Varieties which appear to be relatively susceptible to the effects of infection with Mosaic* :—

Langworthy, Golden Wonder, Arran Chief, Tinwald Perfection, Majestic, Irish Chieftain, Katie Glover, Immune Ashleaf.

* As judged from the condition of the stocks in Scotland.

Varieties susceptible to Blackleg* :—

Kerr's Pink, British Queen, Arran Consul, Great Scot, King Edward VII., Majestic, Rhoderick Dhu, Duke of York, Epicure, Eclipse.

VI.—BOLTERS AND WILDINGS.

Certain conditions which amount to a qualified deterioration may occur in potato varieties independently of the recognised deterioration (virus) diseases. These conditions are seen in the forms which have come to be designated by the terms " bolter " and " wilding."

Bolters.—A " bolter " plant is taller than a normal plant of the variety ; there is a greater distance between the branches of the stems ; the haulm is more open, wilder and more vigorous ; it generally flowers more freely and has an increased capacity for bearing berries ; it is much later in maturing ; it produces somewhat coarser tubers and a large crop if allowed to mature. The condition is perpetuated by the tubers. In the text, immediately following the description of the variety concerned, a note is made if bolters have been found in any of the stocks. Bolters are not generally distinguishable from typical plants until the stage of normal completed growth is reached.

Wildings.—A " wilding " plant has a more bushy habit in consequence of the production of a large number of thin branches, generally all arising from one primary shoot of the seed tuber at or just below ground level. In association with this branching habit there is a tendency to produce a large number of underground stolons, associated with a multiplicity of undersized tubers. The leaf carries very rudimentary secondary leaflets ; the primary leaflets are reduced in number and have a more rounded contour than is normal to the variety. Generally wildings do not produce floral parts ; if these do occur they are very rudimentary. A condition known as the semi-wilding has been found to be common. A semi-wilding resembles a wilding, but differs from it in having, in addition to the wilding stems, one or more stems which are normal and bear normal leaves

* As judged from the condition of the stocks in Scotland.

and floral parts. Tubers from wildings produce either wildings or semi-wildings. Tubers from semi-wildings generally produce semi-wildings, but one instance is known of a semi-wilding stock giving rise to normal plants. Wildings seldom produce ware-sized tubers ; they give a much greater total number of tubers and tubers of seed size than do normal plants, consequently their proportion in a stock in which they occur increases very rapidly. The wildings of most common occurrence are those of King Edward VII. in crops of that variety, of Up-to-Date in crops of King Edward VII., Up-to-Date and Langworthy, and of Langworthy in crops of that variety, Up-to-Date, King George V. and Abundance.

All available information points to the conclusion that there is no infection of either of these conditions in the field or in storage.

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